THE IRON AGE

Established 1855 — New York, October 26, 1911 — Vol. 88: No. 17

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - -
A. I. Findley, - - - - } Editors
W. W. Macon, - - - -

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building — Chicago, Fisher Building
Pittsburgh, Park Building — Cleveland, American Trust Building
Boston, Compton Building — Cincinnati, 807 Andrews Building

CONTENTS.

Iron Ore Readjustments 883
The Cancellation of the Hill Ore Lease 884
The Bonus System Man and His Foreman 885
Excluding Private Liability Insurance 885
September's Record Merchandise Exports 885
Correspondence 886
Reaction from High-Voltage Apparatus 886
Cincinnati Meeting for Promotion of Industrial Education 887
Imports of Swedish Iron Ore 887
Alloys for Steel 887
A Record at a Crane Furnace 887
The Iron and Metal Markets 888
Pittsburgh Foundrymen's Association 898
All-Steel Passenger Cars 898
Machinists' Strike Benefits 898
Personal 899
Obituary 899
The Connellsville Coke Trade 900
To Discuss Relation of Government to Business 900
To Cancel the Hill Ore Lease 901
Railroad Equipment Orders 901
Uses of Blast Furnace Gas 902
Views on Titanium in Iron and Steel 903
Locomotives to Tow Ships Through Panama Canal 903
Ingot Molds of Steel 904
French Iron Ore Production in 1910 904
International Congress on Chemistry in 1912 904
Pittsburgh and Vicinity Industrial Notes 905
Foundry of Tractor Works at La Porte 906
Suit Over a Southern Iron Company Promotion 911
A Mechanically Operated Foundry 912
Motor Driving for Planers 914
The Steel Corporation's Labor Investigation 914
The Washburn Multiple Spindle Drill 915
The International Motor Company 915
New Prentice Radial Drill 916
The Reading Iron Company's Improvements 917
New Allen Riveter Hammer 917
Lubrication of Queen City Shaper 918
St. Louis Blast Furnace Company Litigation 918
Schieren Belting at the Turin Exposition 918
High Pressure Gas Distribution 919
Test of Pulleys 920
The Dreses 6-Ft. Radial Drill 920
Railroad Appliance Exhibition 921
The Machinery Markets 922
Trade Publications 931

Iron Ore Readjustments

Buyers Would Measure Their Effect

A Reduction in Wire Products—Pig Iron Weaker—Advances in Metals

Changes in the market position have been of less importance in the past week than the announcements concerning lower iron ore freights on Minnesota roads and the decision of the Steel Corporation to terminate its lease of the Great Northern ore lands. The whole trade is deeply interested in this latter move, which is taken to mean a reaction from high royalties on Lake ores and in time an adjustment of ore prices to open market conditions in finished steel.

Already there is an attempt to gauge the effect of lower ore freights on the pig iron market for next year. A reduction in ore for 1912 has been looked for, as the $3.50 and $3.70 bases for non-Bessemer ores for this year's delivery have not been maintained, and the 20 cents now taken from Mesaba range freights begets new expectations. Pig iron buyers have been prompt to canvass the effect of the changes on the price of their iron—even that made from this season's ores.

The tendency may be to exaggerate the immediate cheapening effect of the action on the Hill ore lease, as it is yet to run for three years, during which the Steel Corporation must take out nearly 20,000,000 tons to meet contract and accumulated minimum requirements.

Some cross currents are noticed in business in finished material. Pittsburgh reports that the very low prices of the past fortnight are stimulating new demand to a considerable extent. At Chicago, on the other hand, it is noticed that specifications show some falling off. In general the scale of mill operations is still large. At Sparrows Point, Md., however, the steel plant is closed down awaiting rail orders.

The downward tendency of prices has not been arrested, but buyers are trying to buy for longer periods—an effort to which a few manufacturers are responding more willingly than others.

The chief reduction of the week has been in wire products, sales to jobbers having been made at $1.60 for wire nails and at $1.40 for plain wire. A more aggressive attitude has recently been taken by one or two interests. Present prices are at the low level of early May, 1909, from which there was an advance of $2 a ton on May 15 of that year.

Some buying of tin plates is reported on the new $3.40 basis, but large contracts for next year are yet to be placed. Meantime old contracts are being readjusted to the $3.40 level. Sheet mills are less willing to sell ahead at to-day's low level, which can-

not long be maintained without eliminating some producers from the race.

The markets for structural material and plates show some irregularities, and some buyers have not been able to obtain the lowest prices recently made on large orders. In bars, this feature is particularly noticeable, much of the current business of the mills being taken at 1.15c., Pittsburgh.

About 75,000 tons of structural steel will be required for the work now pending in the East. The Madison Square Garden contract for 22,000 tons is now expected within a month, and the Philadelphia Auditorium, 12,000 tons, is about to be placed.

In northern Ohio a sale of 8000 tons of open hearth billets was made at a price equivalent to less than $19 at Youngstown.

In several directions pig iron is weaker. In the East the fact that melters are calling for more iron than furnaces can ship has had no effect upon prices for forward deliveries. Sales are made in all districts for delivery over the first half of 1912 on to-day's basis. In the Buffalo and Chicago districts sharper competition has appeared in the past week. Buying for next year is being postponed in an almost unprecedented way. Prices are admittedly unprofitable, but consumers wait to see what further revisions of furnace costs are ahead.

The copper market has been active with some irregularity in prices. The leading seller is holding electrolytic at 12.50c., representing a slight advance for the week, though it is believed this price can be shaded. Tin and spelter are also higher, and for the time being the principal non-ferrous metals have parted company with iron and steel products. So far as copper is concerned, conditions of supply and demand are no more favorable to advancing prices than in the steel industry.

The Cancellation of the Hill Ore Lease

The official announcement that the United States Steel Corporation had leased the Great Northern Railway iron ore lands in Minnesota was made in the second week in October, 1906. Last week, just five years later, the unofficial yet evidently authorized announcement was made that the Steel Corporation would give the required two years' notice for the cancellation of the lease on January 1, 1915. With the stipulations of this remarkable lease, which fills a printed volume of 1000 pages, readers of *The Iron Age* became fully acquainted through the comprehensive article in our issue of last week. Of the reasons for the abrogation of the agreement much has been written. The Commissioner of Corporations has said in his report that so far as the Steel Corporation has a monopolistic position in the steel industry it rests chiefly on iron ore, and that "its position in the iron ore industry, while by no means constituting a monopoly, is clearly indicative of a monopolistic influence." This main conclusion of Commissioner Knox's 400-page report, taken in connection with the Supreme Court's anti-trust decisions, pointed to one act by which more than by any other the corporation could forestall a possible action under the Sherman law. So ran one interpretation of the decision to cancel. Another, based more on the accumulating disadvantages of the Great Northern lease, from the corporation's standpoint, and on the iron trade's rapid recovery from the scare over iron ore exhaustion, saw in the decision a wise withdrawal from a burdensome contract.

Events to which attention has been called from time to time have shown to how great an extent the Great Northern Railway was able to capitalize in 1906 the iron trade's exaggerated idea of a coming scarcity of ore. The great additions made to the Lake Superior ore reserves in the past five years, the remarkable Mayari and Moa discoveries in Cuba, the better-known possibilities of Brazilian and other South American deposits, the vast resources of Newfoundland and the energetic development of nearby as well as foreign sources of supply for the Eastern iron and steel industry—all have had their share in modifying the notion that the American steel trade had entered permanently upon an era of steadily advancing royalties for iron ore.

As was pointed out when it was put through, the "Hill ore deal" was made possible by the existence of a great consolidation in the steel trade. With the Great Northern ores in other hands the Steel Corporation's position might one day be disputed; if they were held without development they might become the basis of strong new competition. A royalty of 85 cents a ton in 1906, increasing by 4 per cent. a year, as against an average royalty of 25 cents on the Mesaba leases made in 1902 and of 25.3 cents on the Mesaba leases of 1903, indicated strongly the added value given to these Hill ore lands by the fact that the buyer could get all of them in one block. It was also a matter of comment five years ago that the Steel Corporation was the only possible buyer having sufficient low cost ores to allow it to take on such a large tonnage at the highest record price. The theory was that the corporation's total ore consumption would increase to such an extent that even at the maximum of 8,250,000 tons of Hill ores it would have, say, three times as much of its original cheap ores and thus pull down the average cost. But the progressive rate of increase indicated by the charts has not been realized. Against 20,885,000 tons in 1906, the Steel Corporation's Lake Superior ore shipments for 1911 will be between 19,000,000 and 20,000,000 tons, while the high point in the six years was 23,148,000 tons in 1907. It has turned out thus far that the Hill lease has added a relatively large annual tonnage to the vast minimum requirements on which the corporation must pay royalties.

Another difficulty grew out of the stipulation that the Great Northern road haul all the ore from the Hill mines. The most profitable of the Steel Corporation's Minnesota ore roads has this year been handling less than 40 per cent. of its business of 1910, and much of the loss is due to the Great Northern lease. The reduction to 60 cents in the ore rate of these roads, while it cuts directly into their revenue, has no effect on the amount paid under the lease, as any reduction in the freight increases the royalty by that much. As was pointed out in the article of last week, an ultimate reduction from 80 cents to 50 cents in the freight rate would add 30 cents to the ore royalty which, under the lease, would be $2.467 in 1946, or more than $5 to the ton of steel made from this ore!

As the Great Northern lease, with its engrossment of a block of 300,000,000 to 500,000,000 tons of ore, brought Lake ore royalties to a new high basis at one bound, its abrogation will naturally bring some revision of values. The view has been expressed in

these columns on other occasions that the problem of the American iron masters of the next generation would be not so much ore exhaustion as the high valuations of iron ore property established in recent years, with their heavy load of carrying charges and interest which must all enter into steel-making cost. The decision of the Steel Corporation to end the Great Northern arrangement, whatever the preponderating reason, is a step of great significance. It means the establishment of healthier conditions in the basic industry. It means that the domestic steel trade is not to be hampered in its development by unduly high cost of raw materials, and that our foreign trade in steel can expand without the necessity of making wide differentials between the domestic and export prices. For the moment the effect of the 25 per cent. reduction in the ore freight rate on Mesaba range roads may be given first importance—and it is immediately important in its bearing on pig iron costs for next year, while the effect of the decision as to the lease will be felt more slowly. Coming in the same week, these two developments are little short of epochal. In view of the various factors now working toward price readjustments in iron and steel and other commodities, the disappearance of an excessive valuation on ore can only be regarded as salutary.

The Bonus System Man and His Foreman

At the recent meeting of the National Machine Tool Builders' Association the question was raised as to the position of the owner where the earnings of a workman exceed those of his foreman and the latter protests. These cases are common enough. When a premium is placed on the average man's labor and he strives to the utmost to extend his earning power, his income mounts up rapidly, as experience has shown. The employer can afford to pay the higher wage, under the accepted rule that no change in the agreed rate shall be made unless equipment be improved, because he shares with the man the profits of larger and cheaper production. Where a foreman depends upon a stated wage, having no share in the premium, he is likely to be passed in the race for financial returns by those whose work he directs. This is always the case where wages are based on production. The same problem, formerly in an aggravated form, has come up in steel mills, where wages are founded upon tonnage. Expert labor, producing that upon which profits are made, must often earn more than those who direct it.

A characteristic reply to the complaint of a foreman that one of his men is earning largely in excess of his own pay, is to offer him the man's work. In a case cited at the meeting a foreman took exception to the fact that a scraper hand who had been placed on a premium basis had by hard and more intelligent effort acquired a relatively large weekly income, well in excess of the foreman's. The complaint was not in the spirit of begrudging the workman's success, but in the belief that the relative positions of the two as to authority should be carried out in the matter of wages. The owner promptly offered the foreman the job of scraping, which is no sinecure. The proposition was not accepted.

The real solution is to extend the system to include the foremen in the earnings of premiums. A bonus is placed on the production of the department, or of the individual men of the department, always taking as a basis the average of previous production. In one unique instance the foremen were given a certain number of cents per hour of time saved by each workman, but they also were penalized so much per hour for each hour lost from the basis. While a premium system is complicated by its application beyond actual productive labor, the result of extending it to foremen has been satisfactory, according to the general report of those who have tried it.

Excluding Private Liability Insurance

Massachusetts, in its recently enacted workmen's compensation law, created an anomalous condition as to insurance against accidents to workmen. As the statute stands the Massachusetts Employees' Insurance Association is created, to be started under the direction of a board of 15 members, to be appointed for one year by the Governor, their successors to be elected by the subscribers, who are the employers. An amendment provides that the liability insurance companies "shall have the same right as the association to insure the liability to pay compensation provided for by the act, and a policy holder of such company shall be regarded as a subscriber." On the other hand, the act legislates out of business the private liability insurance systems which have been established by some of the large industrial companies.

The reason given for this discrimination is that it serves to protect the small employers, because it compels owners of large works to join with them in the Massachusetts Association. But as the bars were let down for the liability insurance companies it would appear to be an injustice to discriminate against the owners. In most cases their own systems of compensation and insurance are more liberal to the workmen than those provided by the compensation laws of the various States, including Massachusetts. The law exempts the employer from the payment of damages for the first 14 days of idleness on the part of the victim. A common limit set by owners is 10 days. The amount of compensation is certainly as liberal and the money is distributed as wisely. But so far as the insurance feature is concerned all Massachusetts employers who wish to be insured must either become subscribers of the State Association or go in with the liability companies. It would be presumed that the next Legislature will see the wisdom of a fairer attitude toward the large industries.

September's Record Merchandise Exports

September made a record for that month in the volume of exports of merchandise from the United States. The Bureau of Statistics of the Department of Commerce and Labor reports the total value of such exports at $195,771,502, which is almost $30,000,000 higher than the exports of September, 1910, and very much greater than the exports in the corresponding months of previous years. The excess of exports over imports for the month was $70,613,394, although the imports kept up exceedingly well, having been slightly less than for August, but considerably in excess of those for September of any previous year. This highly favorable condition of our foreign trade is one of the bright spots of the present business situation. We are this year loaning a great deal of money to Europe, which is a striking change from our usual experience at this season, when the moving of the crops severely taxes our financial resources.

Correspondence

A Works Chemist's Protest Against Paternalism

To the Editor:—Probably in no other profession in the world is there so much incompetence as in that of iron and steel works chemistry. Cases are common of young men as absolutely ignorant of chemistry as an Italian laborer working in a ditch, and not in the least knowing what they are doing in making an analysis, who nevertheless ask for and get analytical positions at iron and steel works on equal terms with regard to salary with the college graduate in chemistry after his four years' expensive course in general science, engineering and chemistry. This is obviously a wrong condition of affairs and to devise ways of meeting it and correcting it will be the aim of the American Chemical Society at its next winter's meeting.

One of the ways proposed will be to resort to State regulation of the same sort as is now in force in the professions of law and medicine. But the advocates of this system ignore or overlook an important point that it is one of the aims of this communication to bring up. That point is that our colleges in training their men for analytical positions by teaching them general science and engineering—almost everything in fact, except analytical chemistry—this last being thrown in merely as one would sugar a pie, or season a pepperpot, are perpetrating a mild sort of a swindle upon their customers, the works (if the works really want analysts and not engineers in disguise), and that therefore if inadequately prepared analysts are legally debarred from practice it will not only bar out the home-made chemists of the works, but also the young college graduate in "chemistry." For the latter, though far better than the former, still cannot by any stretch of the imagination be considered adequately prepared in analytical chemistry. As a general scientist full of the promise of future great things in some particular line of engineering effort, he is entitled to be considered with the most profound respect. But as an analytical chemist he is at graduation obviously nothing more nor less than a somewhat mitigated humbug.

Imagine the same system of preparation and performance in vogue in other professions. Suppose a doctor, whose college training has been mostly engineering, whose after-study has been almost entirely engineering, and whose highest ambition is to get from the practice of medicine to that of engineering at the very first opportunity!

A FOUR YEARS' COURSE, EXCLUSIVELY CHEMICAL

Your correspondent's four years' college course was almost exclusively chemical, at a greater money cost than that of a regular course, and at the sacrifice of a degree, no degrees being given for special self-selected courses. At the end of his junior year he refused a position as furnace analyst. At the beginning of his senior year he declined another, as works analyst (positions were plentiful in those good old days). Toward the close of his first term senior he did accept one, but resolutely stood his employers off for six months, until he had finished his self-appointed analytical course. But in all this he wishes to confess he was impelled by nothing heroic. On the contrary, his guiding motive was pure cowardice. He feared to face his future employer poorly prepared (but had no fear, on the other hand of missing his degree in the regular course, his grades ranging from 95 to 97, and no conditions against him when he changed to special in his sophomore year); and the young chemical engineer taking up with easy assurance his more or less strange and unfamiliar analytical duties at the works has always been to him an awe-compelling spectacle. Now he has the effrontery to believe that for an analyst with no ulterior engineering aims the training he mapped out for himself was far better than that mapped out for him by his college, and he has always hoped that the four years' exclusive chemical course that he was compelled to sacrifice a degree for would eventually be supplied by our colleges without such a sacrifice. But although over a quarter of a century's fruitless waiting has dimmed this hope, never very bright, yet he must still insist as earnestly as ever that no analyst should attempt to practice without a preliminary four years' college course, exclusively chemical.

GOVERNMENT SUPERVISION NOT WANTED.

Now, then, believing this, should he agitate for the legal requirement of such a course? Heaven forbid! The employer has a right to get his analytical work done by any one—a coal heaver, if he wishes to do so; and the principal relief that your correspondent experiences in writing this letter is the relief it affords him to protest against the silly and vicious spirit of paternalism everywhere rampant in this land of the free.

The State has the right (it is its business, in fact) to brand the incompetent analyst as such, but has no right to say that the individual may not, nevertheless, employ him if he wishes to do so. This unceasing warfare against individualism everywhere and at all times in evidence is excusable in the ignorant and the unthinking, and we must expect it; but we find the educated even more inclined than the ignorant to fall in with the miserable instinct always manifest in a majority to decide for the individual what the individual should be permitted to decide for himself, and the petty disposition to deny to others the cakes and ale it does not care for itself.

In the great (small, in a sense) local option wave, for instance, what chemist has not manfully voted his conviction that the individual cannot be trusted to decide for himself whether or not a glass of beer is good for him (although if the State interfered with his two cups of black coffee for breakfast every morning he would consider it a singularly impertinent and outrageous performance). Or, in the great pure food crusade, what chemist is satisfied with Dr. Wiley's magnificent and legitimate accomplishments as they stand, and would not vote, if he had the chance, to go further and prohibit the cheap or unscrupulous dealer instead of merely showing him up? Ignoring the sacred right of the individual under the constitution to make an ass of himself in any way that he sees fit (provided he does not hurt others), and eat benzoate of soda whenever and how he likes; overlooking also the obvious fact that if a man cannot afford the pure article (as may well happen these days of heavy costs and light business), it is for him and not for the State to decide whether or not he shall take his chances with the benzoated one. Undoubtedly a market entirely bare of "bum" chemists, benzoated food products and the like would be a grand good thing; but freedom is a still better thing—not the freedom to deceive, rob and cheat; and herein, and herein only, lie the State's opportunity and its duty. It is its duty not only to safeguard the individual but his rights and freedom as well, and the prohibitionists and paternalists of all shades and classes are seeking to get the government to a certain extent do the very thing it was instituted to prevent.

When the paternalistic instinct manifests itself as in the foregoing illustrations, it is merely silly and perhaps annoying; but when it goes to the length of curbing trade and crippling business, fixing rates and prohibiting large partnerships, it becomes dangerous and vicious.

Tacony, Philadelphia, October 20, 1911.

GEORGE AUCHY.

Reaction from High-Voltage Apparatus

To the Editor:—While there is an increasing tendency to transmit electric energy in the form of alternating current at higher and higher potential, even for short distances, as witnessed by the 100,000-volt systems recently constructed, a reaction has set in concerning the generation and application of current at high voltages. For a considerable period the talk was all of the economy in first cost, operation and maintenance to be effected by eliminating transformers; and operating engineers who expressed doubts were dubbed "unprogressive" by the superintendents or managers over them. Of late, however, manufacturers of electrical equipment have been led by the accumulating business of their "trouble" departments to withdraw the earlier recommendations of high-voltage windings above, say, 6600 volts for high-speed generators of large capacity and 2300 volts for the smaller sizes, and they are devoting a larger share of attention to securing good efficiency in transformers at lower cost. Similarly the tendency to transmit current from the generator terminals directly to motors at 2200 to 2300 volts is un-

dergoing considerable restriction, particularly where the machines are operated under conditions unfavorable to the insulation, as in damp or humid places. For such service conservative engineers and managers are now making 440 volts the maximum. The determining element will frequently be the effect of a possible breakdown. Where interruption to the service means appreciable loss, even one such instance may much more than offset any possible saving from non-use of transformers and other auxiliary apparatus. ENGINEER.

Cincinnati Meeting for Promotion of Industrial Education

The fifth annual convention of the National Society for the Promotion of Industrial Education will be held in Cincinnati, Ohio, November 2, 3 and 4. Fred A. Geier, president of the Cincinnati Milling Machine Company, and vice-president of the society, together with J. Henry Cone, its secretary, and J. M. Manley, local secretary of the National Metal Trades Association, have arranged an elaborate programme. Letters received from manufacturers, educators and others indicate that the attendance will be larger if anything than at any previous meeting. Cincinnati's different educational institutions will be visited, as well as a number of the leading manufacturing establishments. The programme is as follows:

Cincinnati's Experience in Industrial Education: Thursday, November 2, 2.30 P. M. Co-operative Plan of the University of Cincinnati, by Prof. Herman Schneider, dean, College of Engineering, University of Cincinnati. Vocational Plans in the High School, by Pliny A. Johnston, principal, Woodward High School, Cincinnati. Part Time School for Apprentices, by J. Howard Renshaw, principal, Continuation School, Cincinnati. The Ohio Mechanics' Institute, by John L. Shearer, president, Ohio Mechanics Institute, Cincinnati.

Public Banquet, Hotel Sinton, November 2, 6.30 P. M. How Shall the Obligation to Provide Industrial Education be Met.

What Types of Continuation Schools Are Most Needed in American Conditions. November 3, 9.30 A. M. Chairman, Carroll G. Pearse, superintendent of schools, Milwaukee, Wis. Evening Schools, by Arthur L. Williston, principal, Wentworth Institute, Boston, Mass. Part Time Schools, by Charles McCarthy, former secretary of the Industrial Education Commission of Wisconsin. Summation of discussion by George N. Carman, director, Lewis Institute, Chicago, Ill. Report of Committee on National Legislation, by David Snedden, commissioner of education, Massachusetts.

What Can Be Done for the Factory Worker Through Industrial Education, November 3, 2.30 P. M. Chairman, John Golden, general president, United Textile Workers of America. Charles A. Prosser, deputy commissioner of Education, Massachusetts. Henry Suzzallo, professor of education, Teachers' College, New York.

Industrial Education Necessary to the Economic Development of the United States, November 3, 8 P. M. Chairman, Fred A. Geier, vice-president, National Society for the Promotion of Industrial Education. Ferdinand C. Schwedtman, president, Citizen's Industrial Association, St. Louis, Mo. Edwin G. Cooley, former superintendent of schools, Chicago. H. E. Miles, president, Racine-Sattley Company, and chairman, Industrial Education Committee, N. A. M., Racine, Wis.

Should Trade Schools for Youths Above Sixteen Years of Age be Provided at Public Expense, November 4, 9.30 A. M. Chairman, James P. Munroe, president, National Society for Promotion of Industrial Education, Boston. Charles A. Bookwalter, president of trustees, National Trades School, Indianapolis, Ind. Carroll G. Pearse, superintendent of schools, Milwaukee, Wis. George M. Forbes, president, Board of Education, Rochester, N. Y. Howell Cheney, Cheney Brothers, South Manchester, Conn. Charles H. Winslow, special agent, Bureau of Labor, Washington, D. C. Annual Business Meeting of the Society. Reports of Secretary, Treasurer and Committees. Election of Officers, Resolutions and General Business.

Imports of Swedish Iron Ore

Fully 500,000 Tons to Go to Eastern Furnaces in 1912

PHILADELPHIA, October 23, 1911.—The Swedish ore trade in this country, while of but a few years' growth, has reached large proportions. The regular European markets for the high grade Kiirunivara and Gellivara ores of Sweden, which are mined about 150 miles above the Arctic Circle, have not been neglected, but the development of these properties has gone forward so rapidly that shipments to Philadelphia for distribution to eastern Pennsylvania furnaces will reach fully 500,000 tons next year and will continue to grow, as these ores have been found to work exceedingly well with the other ores used by blast furnaces in that district. Development work at the mines is going forward rapidly and the ore body proved up at the Kiirunivara mine runs up into hundreds of millions of tons, while almost unlimited undeveloped deposits are right at hand.

At the present time the Swedish ore coming to the eastern Pennsylvania territory is within the 0.35 per cent. phosphorus limit, although ores with higher phosphorus content are occasionally purchased. As a rule, however, the actual phosphorus content runs well under the limit, frequently averaging from 0.14 to 0.18 per cent., with a metallic iron content of 67 to 68 per cent. The Bethlehem Steel Company has contracted for 3,000,000 tons of this ore on which deliveries will extend over a period of nine years, the rate of shipment increasing steadily for several years and then being maintained on an even basis during the latter portion of the contract. While a long time contract of this character is deemed desirable by interests consuming their own pig iron, purchases by merchant furnaces have been limited as a rule to their yearly requirements.

The principal difficulty experienced by importers of Swedish as well as other foreign ores is in transportation. The absence of regular return cargoes keeps ocean freights well up and at times they become almost prohibitory, confining shipments largely to producers' own vessels. Last year, ore freights from the Mediterranean to Philadelphia were around $2 early in the season, whereas $1.50 had been done in some years. Later in 1910 charters were made above $2.25, or at 9s 6d., while a good deal of chartering was at 10s. 6d. Efforts are being made to overcome this unfavorable condition in freights and it is the hope of those interested that ultimately they may be able to introduce American bituminous coal into the Swedish and Norwegian markets and thus provide return freights, aggregating 200,000 tons a year, for vessels engaged in the Swedish ore trade. The development of such a trade would be slow, however, as the use of English coal is pretty well established.

Business in Swedish ores for 1912 shipment is thus far limited practically to the contract with the Bethlehem Company and another of several hundred thousand tons, covering shipments to run over several years. A number of the eastern furnaces have not used all the ore bought for this year's delivery, owing to the unfavorable conditions in the iron market, and the consequent reduction in the productive rate. Under the circumstances deliveries in a number of instances have been deferred and current arrivals on order will enable a number of the users to get along without further heavy purchases, probably through the first quarter of next year. The bulk of the current orders for the Kiirunivara and Gellivara ores sold recently have been on the basis of 8 cents a unit, on dock at Philadelphia. Swedish ore from the former district is shipped by way of the port of Narvik, Norway, while from Gellivara shipments come by the way of Lulea, Sweden. At the latter port shipments are deferred during a portion of the winter season, while from Narvik navigation is some times delayed during December and January owing to the Arctic night and prevailing adverse winds.

Alloys for Steel.—In a pamphlet of 36 pages the Primos Chemical Company, Primos, Pa., gives with considerable fullness details concerning its alloys, particularly those of vanadium, tungsten and molybdenum. For some years the company manufactured ferrovanadium from foreign ores, but more recently it has had its own ore supply in the United States. Views are given of its mines and the surface works at Vanadium, Colorado. For twenty-three years the company has manufactured tungsten, and since 1898 from ores from its own mines in this country. Its capacity is 1000 tons of tungsten metal a year. A view is given of the company's tungsten mill at Lakewood, Colorado, having an annual capacity of 1800 tons of concentrates. The pamphlet deals also with ferromolybdenum, ferroboron, nickel, ferrochrome, titanium alloy, silicon, manganese, silicon copper, and Primos steel alloy.

A Record at a Crane Furnace.—No. 2 furnace of the Crane Iron Works of the Empire Steel & Iron Company at Catasauqua, Pa., Harry R. Hall, superintendent, made 1990 tons of iron last week, this being the largest week's record for any furnace in this group. The production of the original furnace No. 1 at Catasauqua in 1840 was 52 tons in its first week. In 1880 there were six Crane furnaces, but the plant consists of three at present, the No. 2 furnace producing as much iron as the total output of three furnaces in the eighteen eighties.

The fortnightly bulletin of the American Railway Association shows that on October 11 the net surplus of idle cars on the lines of the United States and Canada was 35,897, a reduction of 14,141 from the number reported September 27.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 25, 1911.	Oct. 18, 1911.	Sept. 27, 1911.	Oct. 26, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace.	*13.25*	13.50	13.25	14.00
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	*14.35*	14.50	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	15.00
Basic, Valley furnace	12.50	12.50	12.60	13.00
Bessemer, Pittsburgh	15.40	15.40	15.90	15.90
Gray forge, Pittsburgh	13.65	13.65	13.65	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	1.50	1.50	1.50	1.55
Furnace coke, future delivery.	**1.55**	**1.55**	**1.60**	**1.70**
Foundry coke, prompt shipment	1.80	1.80	1.85	2.10
Foundry coke, future delivery.	2.00	2.00	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	20.00	23.50
Open hearth billets, Pittsburgh	19.00	19.00	19.00	24.00
Forging billets, Pittsburgh	24.00	24.00	25.00	29.00
Open hearth billets, Philadelphia	21.40	21.40	22.40	26.00
Wire rods, Pittsburgh	26.00	26.00	26.00	28.50
OLD MATERAL, Per Gross Ton:				
Iron rails, Chicago	13.50	13.50	14.00	16.00
Iron rails, Philadelphia	*16.00*	16.50	17.00	18.00
Car wheels, Chicago	12.50	12.50	12.75	14.00
Car wheels, Philadelphia	11.75	11.75	12.00	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.50	14.25
Heavy steel scrap, Chicago	*9.50*	9.75	10.00	12.25
Heavy steel scrap, Philadelphia	*11.75*	12.00	12.00	13.75
FINISHED IRON AND STEEL, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	*1.20*	1.22	1.22½	1.40
Iron bars, Pittsburgh	1.20	1.20	1.25	1.45
Iron bars, Chicago	*1.15*	1.17½	1.20	1.35
Steel bars, Pittsburgh	1.10	1.10	1.15	1.40
Steel bars, tidewater, New York	1.26	1.26	1.31	1.56
Tank plates, Pittsburgh	1.15	1.15	1.25	1.40
Tank plates, tidewater, New York	1.31	1.31	1.41	1.56
Beams, Pittsburgh	1.20	1.20	1.30	1.40
Beams, tidewater, New York	1.36	1.36	1.46	1.56
Angles, Pittsburgh	1.20	1.20	1.30	1.40
Angles, tidewater, New York	1.36	1.36	1.46	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.15	1.30
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.25	1.40
SHEETS, NAILS, AND WIRE, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.90	2.20
Wire nails, Pittsburgh	*1.60*	1.65	1.65	1.70
Cut nails, Pittsburgh	1.50	1.50	1.55	1.65
Barb wire, galv., Pittsburgh	*1.90*	1.95	1.95	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.62½**	12.50	12.50	12.87½
Electrolytic copper, New York	**12.50**	12.25	12.25	12.80
Spelter, St. Louis	**6.20**	6.10	5.85	5.45
Spelter, New York	**6.35**	6.30	6.00	5.60
Lead, St. Louis	4.15	4.15	4.32½	4.27½
Lead, New York	4.25	4.25	4.47½	4.40
Tin, New York	**42.05**	41.45	38.87½	36.15
Antimony, Hallett, New York	7.70	7.70	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.84	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.20c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in	1.25 to 1.30
H-beams over 18 in	1.35 to 1.40
Angles over 6 in	1.25 to 1.30
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.25 to 1.30
Tees, 3 in. and up	1.25 to 1.30
Zees, 3 in. and up	1.20 to 1.25
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.25 to 1.30
Deck beams and bulb angles	1.50 to 1.55
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.40; galvanized, $1.70. Carload lots, to retailers, annealed, $1.50; galvanized, $1.80. Galvanized barb wire to jobbers, $1.90; painted, $1.60. Wire nails, to jobbers, $1.60.

THE IRON AND METAL MARKETS

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	75	65
¾ in. to 1½ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69
Lap Weld.				
1¼ and 1½ in.	..	..	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	47	..
Butt weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
1½ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1¼, 2 to 3 in. Butt Weld; 2, 2½ to 4 in. Lap Weld — will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		Charcoal Iron.	
1¼ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discount for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., October 25, 1911.—(*By Telephone.*)

Pig Iron.—Reports of sales of standard malleable Bessemer iron at $12.50 at Valley furnace are denied by furnace interests. Some malleable Bessemer iron running over 1 per cent. in manganese and high in phosphorus has sold at $12.50 at furnace, but this is off-malleable iron and was sold in connection with basic iron and at the same price. While it is admitted by consumers that prices have probably touched bottom, they do not seem disposed to contract. We note a sale of 500 tons of No. 2 foundry iron at $13.25, Valley furnace, for November delivery, and also a sale of 4000 to 5000 tons of basic and off-malleable Bessemer iron at $12.50, Valley furnace; also 500 to 600 tons of gray forge iron at $12.75, Valley furnace. We quote Bessemer iron at $14.50; malleable Bessemer iron, $13; basic, $12.50; No. 2 foundry, $13.25 to $13.50, and gray forge, $12.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—Specifications against contracts for billets and sheet and tin bars are coming in at a fairly satisfactory rate and shipments of semi-finished steel by the mills this month will likely show a slight increase over September. Up to October 23 orders sent to the mills for rolling by the billet and rail sales department of the Carnegie Steel Company show an increase over the same period in September of nearly 10,000 tons. Several consumers claim they have been offered Bessemer billets at practically the same price as open hearth, but this is denied by the makers of Bessemer steel, who say they are able to get about $1 more per ton for Bessemer than for open hearth. Prices are unchanged and we quote open hearth billets, $19; Bessemer billets, $20; open hearth sheet bars, $20; Bessemer sheet bars, $21, and forging billets, $24, f.o.b. at maker's mill.

(By Mail.)

The very low prices ruling on all kinds of iron and steel products are stimulating new demand to a considerable extent. Bookings by the leading mills in the past week have been heavier than in any similar period for some months. Buyers are showing a greater desire to place orders, especially for delivery into 1912, than they have for some time. There is much interest in the report that the two railroads owned by the Steel Corporation will make a rate of 60 cents a ton on ore from the Minnesota ranges to Lake Superior instead of 80 cents, the present rate. The new rate will not go into effect until after the close of navigation, so that furnace owners will not have the benefit of it until next year. Pig iron still seems to be weak, and an order for 500 tons of No. 2 foundry iron broke the price 25c. a ton quite easily. Reports of sales of malleable Bessemer iron at $12.50, Valley furnace, have not been confirmed, and it is insisted that if such sales were made the iron was off malleable and not standard. Prices on wire products are also weaker, and concessions of $1 a ton are easily obtainable from what has been regarded as the regular market. It is stated that some contracts for tin plate have been made for delivery through the first half of 1912 at $3.40 per base box f.o.b. Pittsburgh. The low prices ruling on scrap are bringing consumers into the market, and more material is changing hands than for some time. Standard furnace coke is available for the first half of 1912 at practically present prices. The general opinion seems to be that the low prices now ruling on iron and steel products are scraping bottom, but, until the slack capacity is taken up by increased demand, no improvement in prices can be expected. In fact, it is believed that present values will continue probably through the first half of next year at least, unless an extraordinary demand should come up in the meantime.

Ferromanganese.—Consumers in this district are pretty well covered into the first quarter and half of next year, but there are inquiries out for some fairly large lots for delivery in the Chicago and Cincinnati districts. Few sales of ferromanganese have been made since the importers put up the price. We quote 80 per cent. for the remainder of this year at about $37, and for first half of next year $37.50 to $38, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Prices continue very strong and are steadily advancing. It is said that $62, f.o.b. cars Pittsburgh, has been done on several small lots for reasonably prompt shipment. We quote 50 per cent. at $62 and are advised that some sources of supply are asking as high as $64, Pittsburgh. We quote 10 per cent., $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars Ashland, Ky., or Jackson, Ohio.

Muck Bar.—No recent sales have been made here. We quote best grades made from all pig iron at $28, Pittsburgh, but this may be shaded.

Skelp.—The market continues quiet. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—In sympathy with the wire market, prices on wire rods are weak and with little new inquiry. Consumers are not specifying in a satisfactory way against their contracts. We quote Bessemer, open hearth and chain rods at $26, f.o.b. Pittsburgh, but this price might be shaded.

Plates.—Some contracts for cars have been placed and others will be given out in the near future. A good deal of other work is coming up in plates from shipbuilding companies and also for water works systems and the outlook is better than for some time. The material for several new vessels will be rolled by the Carnegie Steel Company. The Riter-Conley Mfg. Company, of this city, has taken some work to be erected in Mexico, requiring about 1500 tons of plates and shapes, which will also be furnished by the Carnegie Company. The New York Central Railroad has placed 2000 steel underframe box cars, 40 tons capacity each, with the American Car & Foundry Company to be built at either

THE IRON AND METAL MARKETS

Detroit or St. Louis, and the plates and shapes will go to the Chicago district. The Pressed Steel Car Company has taken 500 tank cars for the Union Tank Line and has also taken 41 motor, passenger and baggage cars for the Pennsylvania Railroad. The Baltimore & Ohio has asked bids on 1500 steel underframe box cars and the rest of the reported 4500-car inquiry is expected to follow later. The Chicago, Rock Island & Pacific is in the market for 500 furniture cars, 250 flat cars and 25 cabooses, while the Southern Railway is in the market for 50 ventilated box cars. An inquiry is out for a syphon for an aqueduct for Los Angeles, Cal., taking about 9400 tons of plates, bids to close November 17. The plates will be shipped bent and punched, to be assembled on the ground. The general demand for plates is showing betterment, and the mills have more orders on their books than for some months. We quote wide and narrow plates at 1.15c. on ordinary orders and 1.20c. in small lots, f.o.b. at mill. On a very desirable contract for large tonnage and attractive rolling specifications it is probable that the lower price named might be slightly shaded by one or two mills.

Structural Material.—The formal contract with the Carnegie Steel Company for 59,000 tons of plates, shapes and bars for the Quebec Bridge has at last been signed by the St. Lawrence Bridge Company, but shipments will not commence for some time. The Fort Pitt Bridge Works, which recently took some track elevation work at Cleveland, requiring about 5000 tons of steel, has ordered the material from the Carnegie Steel Company. The McClintic-Marshall Construction Company has taken 800 tons for new buildings for the Algoma Steel Company, Sault Ste. Marie, Ontario, and 1200 tons for an addition to the Bellevue Hospital in New York City. The Pittsburgh Bridge & Iron Works has taken 700 tons for an addition to the Government Testing Laboratory in this city. The Thompson-Starrett Company has taken an office building in Charleston, W. Va., about 500 tons, but the order for the material has not yet been placed. The Massillon Bridge & Structural Company, Massillon, Ohio, has taken a baseball stadium at Detroit, about 500 tons. Prices on plain material continue low and we quote beams and channels up to 15 in. at 1.20c., Pittsburgh, but 1.15c. is done on very desirable orders.

Sheets.—A fair amount of new business is being entered by the mills for delivery over the remainder of this year, but some of them do not favor entering orders for delivery into next year at present prices, believing that the market may improve meanwhile. Specifications against contracts are coming in at a fairly satisfactory rate and the mills are operating to probably 60 per cent. of capacity. It is claimed that with sheet bars ruling at about $21, Pittsburgh, sheet prices are as low as they have ever been in the history of the trade and that they are not likely to go lower unless there should be a further decline in prices of bars. One pass black sheets continue to rule at about 1.90c., but on desirable orders some mills are naming 1.85c. at mill, which is bottom of the market. No. 28 galvanized sheets are ruling at 2.90c., but some mills are naming 2.85c. on good orders. Prices on galvanized sheets are reported to be a little firmer, due to the higher spelter market.

Tin Plate.—Since the reduction from $3.60 to $3.40 per base box, several mills state that they have received contracts for tin plate from the meat packers and other large consumers for delivery over the first half of 1912, and it is also stated that some business has been placed at the new price for delivery over all of next year. The tin plate mills are now operating to about 65 per cent. of capacity, but as old contracts have been pretty well cleaned up and consumers will not commence to specify on their new contracts for some little time, it is not probable that this rate of operation will be increased in the near future, but on the contrary may shrink. We quote 100-lb. cokes, 14 x 20, at $3.40 per base box, f.o.b. at maker's mill. The tin plate makers are now generally quoting f.o.b. mill so that to some points of shipment the delivered price figures out slightly less than $3.40 per base box, plus the full freight rate from Pittsburgh.

Steel Bars.—A slight increase in the new demand for steel bars is reported, buyers being willing to place orders a little more freely, believing that 1.10c. on steel bars, which is being done on desirable orders, is probably close to bottom. Specifications against contracts are coming in a little more freely. There is only a fair demand for iron bars, made up mostly of small orders to meet current needs, and specifications against contracts are rather slow, while prices seem to be slightly weaker. We continue to quote steel bars at 1.10c. for desirable orders and 1.15c. in small lots, while iron bars are ruling at 1.20c. to 1.25c., maker's mill, plus freight to point of delivery.

Merchant Steel.—The new demand is better than for some time, due to the low prices ruling, but buying is still confined to small lots to cover actual needs. Shipments this month by the mills will probably show a small increase over last month. Quotations, which are more or less shaded, are as follows: Iron finished tire, ¼ and ½ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—There is practically no new buying of hoops by the cooperage concerns, and specifications against contracts are not coming in at a satisfactory rate. The new demand for bands is also light, being only for small lots to cover actual needs. We quote steel hoops at 1.35c. and bands at 1.15c., extras on the latter as per the steel bar card, but on very desirable orders for shipment at the convenience of the mill these prices would be shaded by some mills, although not over $1 a ton.

Rivets.—The low prices ruling are making the new demand a little better, but buyers are still placing orders only for small lots to cover actual needs. We quote structural rivets at 1.50c. and boiler rivets at 1.60c., f.o.b. Pittsburgh. On a desirable contract for prompt shipment these prices might be shaded.

Wire Products.—New buying of wire nails and wire is still confined to small lots to cover actual needs, jobbers specifying against nails and wire for only such quantities as are needed to maintain stocks. Prices on wire products are weak and concessions of $1 a ton are being made from the basis recently quoted. We quote wire nails at $1.60 to $1.65; cut nails, $1.50 to $1.55; galvanized barb wire, $1.90 to $1.95; painted, $1.60 to $1.65; annealed fence wire, $1.40 to $1.45, and galvanized, $1.70 to $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—The market is firm at 6.15c., East St. Louis, equal to 6.27½c., Pittsburgh.

Shafting.—New orders are only for small lots to cover actual needs. Specifications against contracts continue very unsatisfactory. We quote cold rolled steel shafting at 60 and 5 per cent. off in small lots and 60 and 10 per cent. off the list in carload and larger lots, delivered in base territory. On a desirable specification, for prompt shipment, this price might be shaded.

Railroad Spikes.—Only small orders are being placed to meet current needs. We quote railroad spikes in base sizes at $1.40 to $1.45, f.o.b. Pittsburgh.

Merchant Pipe.—Reports are that the Texas Company, which recently placed 130 to 150 miles of 6-in. line pipe with the Republic Iron & Steel Company, is now in the market for 250 miles of 6 to 8-in. Reports that the Standard Oil Company of Mexico was in the market for 200 miles of 8-in. are denied, but it is stated that it is inquiring for 47 miles. Recent orders placed include 15 to 20 miles of 3-in., 10 to 15 miles of 2-in. steel pipe and about 20 miles of 2-in. iron pipe. The new demand for merchant pipe is fair, and the leading mills are said to be operating to from 60 to 70 per cent. of capacity. It is stated that the new discounts on pipe are being quite well maintained.

Boiler Tubes.—Some fair sized orders are being placed for locomotive tubes, but the new demand for merchant tubes continues very dull. Regular discounts on both iron and steel tubes continue to be more or less shaded.

Coke.—A leading Eastern consumer is reported to have placed a contract for 5000 tons a month of standard grade furnace coke for shipment over the first half of 1912 at about $1.65 per net ton at oven. We also note sales of about 10,000 tons of furnace coke for November shipment at $1.55 per net ton at oven. There is a fairly active demand for foundry coke and some inquiries are out for large tonnages for the first half of 1912. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and for the remainder of the year $1.55 to $1.60 per net ton at oven; foundry coke, 72-hr., prompt, $1.85 to $2, and contract, $2.10 to $2.40.

Iron and Steel Scrap.—The very low prices ruling on all kinds of scrap have stimulated buying and more

THE IRON AND METAL MARKETS

material is moving from dealers to consumers than for some time. A feature of the market is that some dealers are short on heavy steel scrap and are willing to give a little more money for it than consumers are paying. The Pennsylvania and Baltimore & Ohio railroads sold very little material on their October lists on account of the low bids received. It is the dealers' general opinion that prices are probably as low as they will go, and some are not trying to force sales, believing that the market will be better later on. The embargo on scrap routed to Monessen, Pa., has been lifted and this is helping the local market. We note sales of 2500 to 3000 tons of heavy steel scrap, at $12, delivered, a Youngstown interest having taken in considerable in the last few days. We also note sales of 800 to 1000 tons of cast iron borings at about $8.25, delivered. Quotations are again reduced on nearly all grades of scrap to conform to sales made in the past week, and now quote as follows per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00
No. 1 foundry cast	$12.50 to 12.75
No. 2 foundry cast	11.75 to 12.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.50 to 11.75
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.00 to 15.25
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
†Sheet bar crop ends	13.75 to 14.00
*Cast iron borings	8.00 to 8.15
*Machine shop turnings	8.75
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., October 24, 1911.

The slight comfort that has been derived from the tonnage showing in October as compared with September is being dissipated as prices continue to sag and specifications show signs of falling off. Interest appears to be centered in the question of how long mills will continue to quote prevailing prices. The fact that among the pioneers in the quoting of low prices are some of the most strongly intrenched producers points to the probability of buyers retaining their present advantage for some time to come. Specifications for plates, structural material and bars, which have been the mainstay of the finished steel market, show decreases, although the mills report a fair tonnage of car and bridge structural shapes and plates on their books. Prices are generally $1 a ton lower than quoted a week ago and quotations in the West on plates and shapes range from 1.33c. to 1.38c., Chicago. The local pig iron market is colorless and the apathy of melters seems to have reduced trading, both present and prospective, to a dead level. The market for scrap continues very limited; sales are few and local prices are practically established by buyers' offers.

Pig Iron.—Another week during which buyers have displayed but little interest has served only to accentuate the anemic condition of the local pig iron market. Where a foundry receives an order for castings a purchase of immediate shipment pig iron may result and to such transactions the major portion of the week's business may be attributed. It is estimated that melters in this territory are operating at about 60 per cent. of capacity and upon this basis there is little occasion for active inquiry. In addition, incentive to interest in 1912 iron has been discouraged by offers from furnaces covering delivery through the first quarter at current prices and the trade has come to feel that the consideration of future purchases is unnecessary at this time. A few instances are cited where less than $10, Birmingham, has been accepted for No. 2 iron on spot shipments, but for remainder of the year shipment purchases on the basis of $10 are in line with the market. The asking price for local Northern iron continues to be $14.50, more particularly as regards delivery in the first quarter. For immediate shipment there is room apparently for some bargaining. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.75 to 15.00
Northern coke foundry, No. 2	14.35 to 14.50
Northern coke foundry, No. 3	14.00 to 14.35
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

Rails and Track Supplies.—A disposition on the part of some of the Western railroads to make inquiry as to 1912 requirements is being manifested in a tentative manner. From two or three sources inquiry for rails to be shipped this year is also reported. Specifications, however, show a slight falling off as regards both rails and track fastenings. We quote standard railroad spikes at 1.60c. to 1.70c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Interest in structural material as in other finished steel lines is largely concerned with the question of price. Some variation in quotations is noted, depending upon the nature of the specifications, and prices in this territory equivalent to 1.15c., Pittsburgh basis, are not uncommon, while less desirable sales are made at quotations $1 a ton higher. Contracts for fabricated work let during the week contained no tonnage of importance, although an aggregate of 2646 tons was placed. The general contract for buildings for the Union Iron Works, San Francisco, calls for 527 tons of steel which will be furnished by the McClintic-Marshall Construction Company. The Morava Construction Company will furnish 810 tons for the Citizens Bank Building, Tampa, Fla. Contracts taken by the American Bridge Company include 284 tons of girder spans for the Oregon Electric Railway, Rock Creek, Ore., and 289 tons for the St. Joseph Tanning Company, St. Joseph, Mo. The Minneapolis Steel & Machinery Company will furnish 162 tons for a penstock for the Beaver River Power Company, Bliss, Idaho; the Central Iron Works, 163 tons for the Lewis A. Hicks Company, San Francisco, and Dyer Bros., 133 tons for two towers for the Santa Cruz Portland Cement Company, Santa Cruz, Cal. Contracts were also awarded for 174 tons for a steel tank for the American Steel & Wire Company and 104 tons for the Brunet Falls Mfg. Company, Eau Claire, Wis. Mills report specifications for railroad car structural shapes in good volume and also specifications for steel bridges. We quote for plain shapes, mill shipment, at Chicago, 1.33c. to 1.38c. and from store, 1.65c.

Plates.—The past week did not offer as good a showing of plate specifications as had been received in the preceding weeks of the month. Steel cars and bridge work are responsible for a large proportion of the tonnage now in the mills. Very low quotations continue to come to light, and apparently, where freight advantage permits, prices equivalent to 1.15c., Pittsburgh, and less are not too low to offer for desirable specifications. We quote for Chicago delivery, mill shipment, 1.33c. to 1.38c., and from store, 1.65c.

Sheets.—Market rumors to the effect that prices on sheets are now so low as to force some mills out of the market and thus relieve the situation are gaining currency. There is little doubt that the margin of profit in current quotations is uncomfortably small, but the evidence is that the last penny is more welcome than enforced idleness and a real strengthening of the market is not immediately in sight. Orders show a slight decrease in volume. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.08c.; No. 28 galvanized, 3.08c.; No. 10 blue annealed, 1.58c. Prices from store, Chicago, are: No. 10, 1.90c. to 2c.; No. 12, 1.95c. to 2.05c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—The steel bar market is soft and prices for such business as can be found range between 1.25c. and

THE IRON AND METAL MARKETS

1.33c., Chicago. Orders including attractive extras would not be turned away on an even lower basis. Bar iron presents a similar aspect and quotations from 1.15c. to 1.17½c. are the rule. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—Wire nails have not only been in demand in disappointing volume, but have suffered as regards prices from the competitive efforts of the several mills. Plain wire for manufacturing purposes has been in fair demand, but agricultural requirements have been the chief support of the trade in wire products. Jobbers' carload prices, which are also quoted to manufacturing buyers, are as follows, per 100 lb.: Plain wire, No. 9 and coarser, base, $1.58 to $1.63; wire nails, $1.78 to $1.83; painted barb wire, $1.78 to $1.83; galvanized, $2.08 to $2.13; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The demand is somewhat slack and requirements recently advertised have been slow of placing. Awards at Woodstock, Ill.; Long Beach, Cal., and Muskegon, Mich., are still pending. At Chicago 500 tons were awarded to the United States Cast Iron Pipe & Foundry Company. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—The bottom to which prices of old material at Chicago will descend is apparently dependent upon the Eastern markets. Local consumers are taking so little that scrap must either be sold out of the local market or practically at the buyer's price. Declines from the quotations of a week ago are noted on nearly all grades of scrap and we have revised our prices accordingly. Offerings by the railroads are heavy only in view of the lifeless market and include a small list from the Toledo, St. Louis & Western and one from the Soo line. The Chicago, Burlington & Quincy has about 2500 tons and the Chicago, Rock Island & Pacific about 2000 tons, of which the principal item is 600 tons of rerolling rails. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 12.75
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.25
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.25 to 8.75

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	9.00 to 9.50
Iron car axles	17.00 to 17.50
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	9.00 to 9.50
Steel knuckles and couplers	9.25 to 9.75
Steel springs	9.75 to 10.25
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.75 to 6.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	8.00 to 8.50
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.75 to 7.25
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, PA., October 24, 1911.

Interest centers in the finished material market, where price concessions still continue available if the business offered is attractive. Open quotations for plates and shapes are unchanged, but it is more freely admitted that they can be shaded. Fabricated structural material, while in good inquiry, lacks definite developments. Railroads are making further inquiries for cars, but the aggregate does not appear particularly encouraging to builders. Steel bars are easier, with prices showing a lower tendency, while iron bars are openly quoted at a lower basis. Billets are firm, while sheets have been in better demand. The statistical position continues to favor the pig iron seller, but has not resulted in any particular strengthening in the market.

Iron Ore.—Very little new business is anticipated at this time, although small purchases are made from time to time to piece out requirements. Developments in foreign ore are particularly quiet. Importations during the week included 6050 tons from Spain, 5039 tons from Sweden and 15,265 tons from Cuba.

Pig Iron.—Consumers are showing a trifle more interest in the market, not particularly that the method of making purchases has changed, although a few more sizable lots were taken on, but rather due to the indifference of the majority of the principal producers in this district. It is clearly evident that stocks on furnace yards are steadily declining, and that few producers contemplate any further increase in the active capacity at the present basis of prices. There is also a growing scarcity in some brands of foundry iron for shipment the remainder of the year; producers are pretty well sold up and while they may still be able to take care of regular customers' needs, they are not willing to sell very far ahead at to-day's quotations, as from present indications no material advance for early 1912 deliveries is anticipated. Several sales of 500-ton lots of No. 2 X and No. 2 plain iron are reported and, in one instance an order for 1200 tons was taken, the former grade at $15 and the latter at $14.75, delivered, shipments ranging from early to the end of the first quarter. A new selling basis of the leading Virginia producer is announced, in which a differential between the higher grades for first quarter shipment applies. This company now quotes No. 2 X at $12.75, No. 2 plain, $12.50, and No. 3 foundry and lower grades, $12.25, at furnace, for the delivery named, with $12.50 applying for all foundry grades for this year's delivery. The latter quotation about represents the general market for Virginia foundry, for three months' delivery, although it is probable that it would be shaded for less desirable brands. Several 1000-ton blocks of Northern No. 3 and No. 4 iron have been moved at a price close to $14.20, delivered, while a trade deal involving 1000 tons of Virginia low grade, with a pipe foundry in that district, is reported. Negotiations are still pending for some large lots of low grade iron by Delaware River interests, but no important transactions have yet been announced. A better inquiry for forge iron comes from puddling mills, with negotiations pending for several 500-ton lots, while an inquiry for several thousand tons, previously reported, is still pending. Several small and one moderate lot sale are reported at prices ranging from $14.25 to $14.45, delivered. Developments in steel making irons are meager. The recently reported inquiry for first quarter basic is still unclosed, with no fresh inquiry coming out. First quarter basic has been quoted, it is stated, at $14.75, delivered. Small lots of low phosphorus iron are moving at the market. The general range of quotations for delivery in buyers' yards in this territory is unchanged, although shipments, instead of being confined to this year, are frequently extended to cover the first quarter of 1912:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—Some uncertainty surrounds transactions in ferromanganese. While the principal sellers claim to be holding at $38.50, Baltimore, for 80 per cent. for next year's delivery occasional small speculative lots for early shipment are evidently moving at prices ranging from 50c. to $1 under that figure. No inquiry of any size has recently developed in this district. Local sellers quote 50 per cent. ferrosilicon at $62, delivered, without fresh inquiry. Furnace ferrosilicon within the Bessemer limits as to phosphorus and sulphur is quoted at $27.30 to $28.30, delivered here.

Billets.—Orders do not come out freely, but there is a tendency toward better quantity buying. The recent weakness in prices does not seem so pronounced, and while $21.40, delivered here, is still available for open hearth rolling billets on strongly competitive business ordinary current orders command $22.40, delivered. Differentials on forging billets are irregular, although the market is quotable at $26.50 to $27.50, delivered in this district.

Plates.—Sharp competition for large quantities continues, but all mills do not meet the low prices reported. Orders have been closed for some 3000 tons of ship plates, which are said to have been placed with an Eastern mill. There is still considerable business in

THE IRON AND METAL MARKETS

ship and structural plates pending. The general run of miscellaneous business continues on an even basis. For ordinary current business mills in this district make quotations ranging from 1.35c. to 1.45c., delivered in this vicinity, although on strongly competitive business prices as low as 1.30c. are reported, but not officially quoted.

Structural Material.—A better run of orders is reported in plain shapes. Several contracts for fabricated work are still under negotiation. Some new propositions have developed, including an addition for the New York Shipbuilding Company, requiring some 1700 tons. A six-story office building in Williamsport, Pa., is nearly ready for estimate. A hotel in Washington, D. C., covering about 500 tons, is being figured on. The addition to the erecting shop for the Baldwin Locomotive Works is still unclosed. Quotations cover quite a wide range, dependent on quantity and specifications. For ordinary plain shapes 1.40c. is usually quoted, but on desirable business as low as 1.30c., delivered here, has been named.

Sheets.—Eastern mills report a materially better run of business; consumers are ordering in larger quantities and placing some contracts for more extended periods. Mills are therefore operating on a more favorable basis and prices show a greater tendency toward firmness. A fair volume of business in ordinary sheets is also to be noted.

Bars.—Some little contracting is noted in iron bars and mills are a trifle better fixed as far as orders are concerned. Some mills are operating on a 75 per cent. basis. Prices have, however, developed further weakness, and on particularly desirable business 1.20c., delivered, can be done for iron bars, although 1.22c. to 1.25c. represents quotations covering ordinary business. Steel bars are not particularly active and it is reported that 1.25c., delivered here, can be shaded.

Coke.—Small contracts for foundry coke have been entered and consumers are taking deliveries freely. A fairly good demand for heating coke is reported, this grade being quoted at $1.20 to $1.30 at oven. Foundry grades still command from $2 to $2.35, at oven, according to grade. Some inquiry for furnace coke is reported both for prompt and forward delivery, although business transacted is largely confined to spot shipments. The following range of prices per net ton is named for delivery in this district:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—Consumers are giving the situation a little more attention and purchases in some grades have been larger. It is pretty generally considered that prices are now at bottom and that but a slight buying movement would materially stiffen the market. Sales of heavy melting steel have been made at prices ranging from $11.75 to $12, delivered, in one instance 2000 tons moving at the inside figure. Rolling mill grades are being inquired for a little more freely, and some classes of specialties have been in better demand. Moderate sales of iron rails and car wheels have been made. Bids went in on October 25 for 610 tons, approximately, of Panama scrap, arriving at this port. This is understood to be material collected before the recent contract for the remaining French material on the Isthmus was closed. A few changes are noted in recent quotations. The following range about represents quotations at which the ordinary current business for prompt shipment can be done, delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.75 to $12.25
Old steel rails, rerolling (nominal)	13.00 to 13.50
Low phosphorus heavy melting steel scrap	16.25 to 16.75
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails (nominal)	16.00 to 16.50
Old car wheels	11.75 to 12.00
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	11.25 to 11.75
No. 1 forge fire	10.00 to 10.50
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Cleveland

CLEVELAND, OHIO, October 24, 1911.

Iron Ore.—The Pittsburgh Steamship Company announces that it will load its last ore boats this season during the week ending November 18. That company yesterday notified managers of independent vessels that no more outside shipments will be loaded by it after this week. No barges of the Pittsburgh fleet will be sent up the lakes for ore after to-morrow, and those now in commission will be laid up as soon as they arrive at lower lake ports. This will cut down the number of vessels employed in the ore trade by about 50. Merchant ore firms expect to be about through with their shipments by November 15. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market shows some improvement both in the volume of inquiry and sales. A western Ohio malleable consumer has bought 250 tons of malleable iron for prompt shipment from a nearby furnace at a reported price of $13.75. The same melter is in the market for 1500 tons for delivery during the remainder of the year and the first half of next year. A Michigan stove maker has bought 1500 tons of 5 to 6 per cent. silicon iron for the first half delivery. A Cleveland foundry has purchased 600 tons of No. 3 foundry for the last and first quarter. A sale of 500 tons of No. 2 foundry was made in Akron for the first quarter delivery. A local interest has sold 500 tons of No. 2 foundry for prompt shipment in Pittsburgh at $13.25, Valley furnace. A Cleveland foundry is in the market for 1000 tons of foundry iron for November and December delivery. Another 1000 ton inquiry is from a central Ohio implement manufacturer, this being for 600 tons of No. 2 soft and 400 tons of No. 2 strong for the first half delivery. Another inquiry is for 500 tons of foundry iron for the next two months. Several smaller inquiries for foundry iron for the remainder of the year and for the first quarter are pending. Several sales of Southern iron, in lots of from 100 to 300 tons, are reported. Reports of a leading selling agency show a fair gain in shipments during the past two months. September showed an increase over August and October so far shows about a corresponding increase over September. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.40
Basic	13.40
Northern foundry, No. 2	13.75
Gray forge	13.00
Southern foundry, No. 2	$14.35 to 14.60
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The market is very quiet, the only demand being for small lots of foundry grades. We quote standard Connellsville furnace coke at $1.50 to $1.55 for prompt shipment and $1.55 to $1.60 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2.10 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—The demand in finished lines is only moderate. Consumers generally are buying only in small lots for early requirements. We note the sale of 10,000 tons of open hearth billets. Of these 8000 tons were contracted for by a northern Ohio consumer for delivery until April 1 at less than $20, delivered, which is equivalent to a shading of $19, Youngstown. The demand for steel bars is not active and prices are still unsettled. While mills generally are asking 1.10c. to 1.15c., Pittsburgh, there are frequent reports of a price quotation of 1.10c., Youngstown, which in this market means a concession of $1 a ton from the 1.10c., Pittsburgh, price. Plate prices are irregular. While 1.20c., Pittsburgh, is the usual quotation this price is not being maintained by the smaller mills or by all of the larger ones. The minimum quotation appears to be 1.15c. The structural market is firm at 1.20c. The demand for structural material is only fair. Little work is in prospect requiring good sized tonnage. The Forest City Steel & Iron Company, Cleveland, has taken 600 tons for trestle and building work for the American Stove Company, Cleveland. Offices to be erected in Cleveland by the National Electric Lamp Company will require 200 tons. Orders for sheets are not numerous. Small Ohio sheet mills are generally busy, but have orders for only a short time ahead. Sheet prices are stationary at 1.85c. to 1.90c. for No. 28 black and 2.85c. to 2.90c. for No. 28 galvanized. Both of the local bar iron mills are getting

THE IRON AND METAL MARKETS

enough orders to keep running. Iron bars are quoted at 1.20c., Cleveland, which price is being maintained.

Old Material.—A local consumer has bought 3000 tons of steel making scrap, mostly heavy steel, at prices ranging from $10.50 to $11. The remainder of the tonnage contracted for was turnings at $7.75 to $8 per gross ton, delivered. The market generally is very dull. There is very little inquiry from consumers, and dealers do not want to buy as their outlook for early sales is not very promising. Prices are still weak, but quotations generally are unchanged. The Nickel Plate Railroad received bids October 24 on a list of about 500 tons. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.50
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	10.50 to 11.00
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.25 to 11.75
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Leading vessel owners in Cleveland have taken up the matter of attempting to form a merger of the independent fleets. A meeting has been called to discuss the subject and to consider plans for a combination, and it is possible that some definite action will be taken before the end of the year. Conditions in the lake trade have been very unsatisfactory during the last two or three years and vessel men see little hope of much improvement until some change is made in the method of conducting the lake transportation business. With the bulk of the independent boats under one management vessel owners believe that they will be able to effect economies that would come to a large fleet under competent management. With the boats under one management only as many as are needed would be put in commission; there would be a saving as compared with the present methods and stockholders would be more certain to get a fair return from their investments.

Birmingham

BIRMINGHAM, ALA., October 23, 1911.

Southern iron makers have been watching very closely the condition of the Pittsburgh market, as well as the sales made by Eastern blast furnaces. It has been noted with much interest here that, despite the fact that there was an increase in production during September, pig iron consumption is undoubtedly slightly in excess of the production at this time. However, this is due largely to the consumption of steel-making irons, with the result that foundry iron is still at low ebb. As a matter of fact, prices ruling today are as low as they have been any time in many months, and pig iron is offered here for shipment through to July 1, 1912, at $10 for No. 2, while some concession has been made in grades corresponding to No. 2 foundry by analysis, where the iron is on the yard and has been sold on an analysis basis, strictly for prompt shipment. Shipments this month have been liberal; at the same time the production in this district will doubtless be fully up to the production of any month of the year. There are only about three interests that will consider sales for delivery into the year 1912. Undoubtedly present selling prices do not take care of the actual cost of production, including reasonable charges for royalty and depreciation at a great many furnace plants in this district. Quotations f.o.b. cars Birmingham, per ton of 2240 lb. are as follows:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00

Cast Iron Pipe.—Shipments are moving forward on previous contracts at a very satisfactory rate. The plant of the Dimmick Pipe Company, which, as previously reported, has been taken over by the United States Cast Iron Pipe & Foundry Company, is being overhauled and in a few weeks will be ready for operation. It is understood that when this plant is put in operation, one of the other plants of the United States Cast Iron Pipe & Foundry Company will be shut down and overhauled, and that in a like manner, one by one the entire list of shops of the company will be taken in hand. Quotations remain as follows per ton of 2000 lb., f.o.b. cars Birmingham district foundry: 4-in. to 6-in., $23; 8-in. to 12-in., $22; over 12-in., average, $21, with gas pipe taking its usual differential of $1 a ton higher.

Old Material.—There is still very little demand for scrap iron in this market, and there is less life in the market than in a long while. Prices are far from attractive and the tendency is to accumulate and hold for higher prices, rather than to seek to place material on the prevailing schedule of prices, which would be approximately as follows, per gross ton f.o.b cars here:

Old iron axles (light)	$12.50 to $13.00
Old steel axles (light)	11.50 to 12.00
Old iron rails	11.50 to 12.00
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.50 to 7.00
No. 2 country wrought	6.00 to 6.50
No. 1 machinery, cast	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.00 to 9.50
Light cast and stove plates	6.00 to 6.50

Buffalo

BUFFALO, N. Y., October 24, 1911.

Pig Iron.—There has been quite a little buying during the week, principally in small lots, aggregating 7000 to 8000 tons, largely foundry grades, but including a few small lots of malleable and one or two of basic. Deliveries are for remainder of year and first quarter to first half of 1912. Some improvement in demand from foundries supplying the railroad trade was noted in the week. It was rumored an inquiry for a large tonnage of basic from the Chicago district was under negotiation; but it could not be substantiated among Buffalo furnaces. Shipments on contracts continue large. Prices are approximately the same as last week's schedule. We quote as follows, f.o.b., Buffalo, for current quarter and delivery over first quarter of next year:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—A larger amount of business in steel bars has been placed during the current week than for some time past and the tone of the market is somewhat stronger. The leading interest reports a heavier tonnage of new business in bar products than for many weeks. A slightly firmer feeling is noted for small lot orders on the part of sellers, although this does not extend to large tonnage orders. There are some fair sized inquiries for plates before the trade; but prices are somewhat less steady in this line and some extremely low figures have been made on desirable business. There seems to be quite a desire on the part of many buyers to take advantage of the prevailing low prices and lay in stock rather than risk holding off longer for the chance of prices reaching any lower level. A moderate amount of inquiry for shapes has been received during the week and a number of orders have been placed, principally in small lots. In fabricated structural lines the week has been quiet. A good many structural jobs of considerable importance, however, are to come up for figuring this fall and during the winter. There is a good deal of grade crossing work in the city of Buffalo to come before contractors for bids early next year. Bids were opened this week for the steel for the new Shea Theater building, about 350 tons. Bids also went in this week on the New York Telephone Company's building on Elmwood avenue, requiring 240 tons. Figures are soon to be taken for the Vocational High School building at Syracuse.

Old Material.—The week has shown no change from the conditions prevailing during the past few weeks. Demand is slack, with very little new business in sight. No changes in prices are noted; dealers are not endeavoring to force sales by price reductions; preferring to

THE IRON AND METAL MARKETS

hold material rather than to dispose of it at prices at present obtainable. We quote as follows per gross ton, f.o.b., Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Boston

BOSTON, MASS., October 24, 1911.

Old Material.—The market continues dull and uneventful, with no large transactions of importance. Prices are soft, and No. 1 wrought and soft steel has dropped 50 cents. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston, and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.20 to 14.70
Old iron axles	17.70 to 18.70
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.75 to 8.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery, cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

St. Louis

ST. LOUIS, MO., October 23, 1911.

Although there is some improvement in the total of business for the past week, prices remain at the level last reported. Everything is bought for immediate shipment. Buyers seem to be satisfied that they can have as good prices or even better when coming requirements bring them into the market again.

Pig Iron.—Sales the past week have been of the carload lot order and not many of these. Although the quotation stands, nominally, at $10 to $10.50, Birmingham, for No. 2 Southern, according to delivery, it is pretty well understood that buyers can do better. Despite the low prices there is no apparent tendency to come into the market for bargains. There is some tendency to make inquiries for analysis iron, but usually this is very evidently a means of getting around the quotations on standard grades.

Coke.—Coke movement the past week has been almost altogether on requisitions on existing contracts. About the only purchasers in the market are seeking the product for winter heating purposes. The quotations on 48-hr. coke stands $1.60 to $1.70 at oven, but little is doing. For 72-hr. best selected Connellsville or Stonega, the figure is $1.90 to $2.15 for last quarter delivery. For first quarter the range is $2.10 to $2.25. The only sale reported during the week amounting to anything was 600 tons of 72-hr. Connellsville by the Pioneer Company.

Finished Iron and Steel.—Prompt shipment is the order of the day in conjunction with finished steel orders, the evident intent of purchasers being to get the material into use and to get their payment therefor before it becomes necessary to settle. Absolutely nothing is going into stock. In structural steel the week's tonnage has been better than the total of last week, but the orders were all small. In standard rails the only transaction of the week was one of about 7700 tons sold by the local branch of the Steel Corporation to the Kansas City, Clay County & St. Joseph Interurban road for delivery in November and December. That road has completed its financial arrangements and construction is already under way. Light rails continue to show increased request from the coal mines, which are becoming more active, but the lumber roads are doing very little. Bars and plates show little movement even on an acknowledged basis of $1.10, Pittsburgh, for the former. Track fastenings have been in only fair request.

Old Material.—A small list came out during the week, 400 tons from the Chicago & Eastern Illinois, but this has not closed yet. It is not expected, however, that it will show any improvement in prices. Dealers are taking what they can get at low prices to ship on contracts and are buying, where advisable, against future rises, but there is no specific activity in the market, nor does there appear to be any expectation of any for some time to come. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron fish plates	$10.50 to $11.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	5.00 to 5.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

The German Iron Market

BERLIN, October 13, 1911.

From the Silesian district it is reported that business has latterly improved and that an advance in prices is planned. From the Siegerland district, where the best German ores are mined, it was announced yesterday that the Ore Association had decided to restrict its production to 70 per cent. of the capacity of the mines, after having hitherto kept up a production of 85 per cent. The cause assigned is that the furnaces are calling for ores less promptly. The pig iron figures published several days ago show a decline in production, but not of sufficient volume to make itself felt so seriously in the ore trade. The product for the month was 1,250,700 metric tons, against 1,285,900 tons in August. This gives a daily rate of 41,482 tons, which is 134 tons a day less than in August. High water mark was touched in April with 42,847 tons. For the first nine months of the year there was a gain of 585,200 tons over the corresponding period of 1910.

It is expected that the Pig Iron Syndicate will fix its list prices very soon. However, the fact now transpires that there are still some points to be arranged between the syndicate and the Luxemburg-Lorraine group.

It is reported that the efforts begun some six weeks ago looking toward another organization of the bar trade are not making any visible progress; most of the works show little disposition to take part. In view of the fact that the bar trade continues very active it is already stated that another appeal will be made to the Steel Works Union to increase the allotments in this specialty. Some of the works are exceeding their allotments and paying the penalty of 20 marks per ton on the excess. Of course it does not pay them to do it, but they are willing to incur this heavy penalty in order to be able to apply, with some show of reason, for big allotments when the negotiations for renewing the Union are taken up within a few months. It is stated that a committee will be appointed at the end of this month to begin the preparation of the plans for renewing it upon its expiration at the end of next June.

According to late news from the hardware trade of the region about Remscheid and Solingen the effects of the war in the Mediterranean Sea are beginning to be pretty severely felt in some lines. Many orders have been canceled from both countries. At Solingen some of the shops have had to reduce their make by one-third, while at the railroad station large quantities of cutlery have been piled up waiting in vain for orders to be sent forward. The unfavorable business position in Russia is also felt in the hardware trade. It is difficult to make collections there.

THE IRON AND METAL MARKETS

This week there is a further batch of important company reports. The Bochumer Guss-stahl Verein reports gross profits of 6,248,000 marks, which compares with 5,420,000 marks last year; the dividend is 12½ per cent. on a capital of 30,000,000 marks, against 12 per cent. last year on 25,200,000 marks. On the other hand the Bismarckhütte of the Silesian district, a concern of considerable importance, has been compelled to pass its dividend, after having paid 7 per cent. last year. The directors say the reduction in earnings was caused partly by the bad state of the market for bars and pipes, partly by delay in getting building operations on the works completed. The annual stockholders' meeting of the Hasper Company called forth very optimistic remarks from the general manager concerning the state of business in the iron trade. He said the various mills were crowded with orders for bars, plates and wire to an extraordinary degree and he expected these conditions to continue for some time. He added that the Morocco situation and the Italian-Turkish war had been hitherto without effect on the iron trade.

Iron shares are again rising on the Berlin Exchange, after having lost heavily in September.

Cincinnati

CINCINNATI, OHIO, October 25, 1911.—(*By Telegraph.*)

Pig Iron.—There was some improvement in the total amount of iron sold in the past week. Among sales reported are 1400 tons, about equally divided between Northern and Southern grades, for a central Indiana melter. A southern Indiana consumer took 800 tons of No. 2 Southern foundry and 400 tons of Southern gray forge was contracted for by a Michigan manufacturer. Order books show an increase in the number of carload to 100-ton orders. Although prompt shipment prices are unchanged deliveries have been extended and No. 2 foundry is now obtainable for first half shipment on a basis of $10, Birmingham, and $13, Ironton. While the nominal quotation for malleable is $13.25 at furnace it is being sold in small quantities at $13, with deliveries extending into next year. About 1200 tons of malleable was bought by a central Ohio firm from a nearby furnace for delivery through the next six months. Inquiries include 600 tons of No. 2 Southern foundry and 400 tons of Northern for a central Ohio melter. From the same territory is one for 300 tons of No. 2 Southern foundry to be shipped this year. It is reported that 100 tons of Lake Superior charcoal iron was recently sold to a customer in the Birmingham district. There is no change in the Northern furnace situation, but it is stated that stocks are steadily declining in the Hanging Rock district. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Business is very dull and there is no demand for either furnace or foundry grades, with the exception of a limited call from small foundries that are purchasing on a hand to mouth basis. A few contracts have been made lately covering small quantities of coke for gas making and domestic purposes, and it is rumored that in one district purchasers were able to obtain 72-hr. coke at prices usually ruling for the 48-hr. product, although it is admitted that in such cases the coke was loaded for shipment and had to be moved promptly. Connellsville furnace coke is quoted at $1.50 to $1.55 per net ton at oven for prompt shipment, with Wise County and Pocahontas grades bringing about $1.60 to $1.65. Foundry coke in all three districts remains around $1.90 to $2 per net ton at oven for immediate shipment and contract business for both furnace and foundry grades is solicited at an advance of from 10c. to 25c. per ton.

Finished Material.—Mill agencies report a larger number of inquiries as a result of the present low prices prevailing, but state that contracts now being placed are for very small tonnages. Sheets are only in fair demand and steel bars are also moving a little slowly. The local warehouse quotation for steel bars is 1.60c. and for structural material 1.70c.

Old Material.—The market continues very weak and the maximum buyers' prices given below about represent their selling figures. A seller would also have a hard time obtaining the minimum quotation for any material that he might have to offer. No change in the situation is anticipated until pig iron prices are revised. The approximate prices paid by buyers, delivered in their yards in southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.00 to $10.50
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting steel scrap, gross ton	9.75 to 10.25

The Domhoff & Joyce Company, Cincinnati, which has represented the Stonega Coke & Coal Company in the exclusive sale of its foundry coke in Central Western territory since the ovens were put in operation about 15 years ago, has steadily widened its selling limits. The Chicago district was added when the Domhoff & Joyce Company opened its Chicago office, and about three years ago, when it opened an office in St. Louis, the territory was extended to the entire Western section. In all this time F. A. Goodrich & Co. retained Michigan, but on October 21 the Stonega Company advised the Domhoff & Joyce Company of the award of the exclusive selling agency for that locality and it is now the sole Western representative in the sale of Stonega and Roda foundry cokes. The new territory will be divided among the men traveling from the company's Chicago, Indianapolis and Cincinnati offices.

New York

NEW YORK, October 25, 1911.

Pig Iron.—The scale of inquiry and of actual buying has changed very little since last week. The market shows the sentimental effect of the decision to cancel the Great Northern Ore lease, but in some quarters the point seems to be overlooked that the status of the Hill ores will not change for three years. However, the reduction in ore freight rates on Minnesota roads is regarded as a factor having a more immediate bearing on the market since it will be effective on ore shipped in April, 1912, and will amount to 40 cents a ton of pig iron. Some further buying is reported by furnace castings manufacturers in New Jersey, and several other foundries on that side of the river have been in the market. There is also a fair amount of inquiry from New England, one Providence company's notification that it would buy for the first few months of 1912 bringing out very active solicitation for the business. Buffalo prices have been a trifle weaker and selling for the first quarter and even for the first half of 1912 is reported at prices ranging from $13 to $13.25 (according to delivery) at furnace for No. 2X. Rather sharp competition in the New England market is reported also in the case of Lebanon Valley foundry iron. In some cases canal charters from Buffalo to New York have been made as low as $1.50, which is lower than was possible in the last few weeks of the season in 1910. However, sales based on water shipment from Buffalo are about at an end for this year. Our quotations are as follows for Northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2X, $15 to $15.25; No. 2 plain, $14.50 to $14.75. For Southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Cast Iron Pipe.—The market is dull and no public lettings of size have appeared since the announcement of the bids to be opened October 31 for the 7000 tons of 48-in. water pipe for Brooklyn. Car load lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater, although prices were considerably shaded on a recent letting.

Finished Iron and Steel.—Practically no new projects have appeared since last week's report and practically none of the projects pending has been closed. Prices remain at the same basis, relatively firm, as

THE IRON AND METAL MARKETS

compared with those recently obtaining in other sections of the country. In fact, some work, even in plates, in lots of 50 to 75 tons, has gone for very good prices. It is admitted that the lower range of prices remains substantially undisturbed through the lack of single large orders. The volume of business in bar iron continues still below normal and there is nominally no change in price for refined iron. The award of 1500 tons for the Otis Elevator building in New York has been practically closed; it is expected that within a week's time the steel will be placed for the 1500-ton Seamen's Institute, Coenties Slip. The award of the 8000 to 10,000 tons of the Philadelphia Auditorium building rests between the Pennsylvania Steel Company and the American Bridge Company. The McClintic-Marshall Construction Company is understood to have the 4000 tons for the Washington postoffice and also 1600 tons for the New York Shipbuilding Company. A theatre on the Bowery, New York, requiring 800 tons is advanced as a new project and the Hotel Flanders, West Forty-seventh street, is to have a 700-ton addition. There is nothing new to report of other projects recently mentioned in this column. Quotations are: Plain structural material and plates, 1.36c. to 1.46c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.20c. to 1.25c., all New York. Plain material and plates from store, New York, 1.70c. to 1.80c.

Old Material.—Scrap market conditions have grown worse in the past week so far as concerns prices of the descriptions most commonly in demand. There is a limit to rejections of material even in a market like the present, as consumption must go on even though at a low rate. In some directions material is taken with a little more freedom on contracts, but new buying is very light. Reports continue of very low prices in particular cases where material has been rejected and it is believed conditions can hardly get any worse in this respect. We quote dealers' prices, per gross ton, New York and vicinity, as follows:

Old girder and T rails for melting	$9.25 to	$9.50
Heavy melting steel scrap	9.25 to	9.50
Relaying rails	20.00 to	21.00
Rerolling rails	11.25 to	11.75
Iron car axles	19.50 to	20.50
Old steel car axles	15.00 to	15.50
No. 1 railroad wrought	11.00 to	11.50
Wrought iron track scrap	10.50 to	11.00
No. 1 yard wrought, long	10.25 to	10.75
No. 1 yard wrought, short	9.25 to	9.75
Light iron	3.75 to	4.25
Cast borings, clean	5.75 to	6.25
Mixed borings and turnings	4.75 to	5.25
Wrought turnings	5.25 to	5.75
Wrought pipe	8.50 to	9.00
Old car wheels	9.75 to	10.25
No. 1 heavy cast, broken up	9.75 to	10.25
Stove plate	7.75 to	8.25
Locomotive grate bars	7.75 to	8.25
Malleable cast	9.75 to	10.25

Ferroalloys.—Some sales of odd lots of spot ferromanganese are reported to have been made at $38, but it is believed that these odd lots are now about cleaned out. The recent inquiries of Western consumers are evidently not yet closed, as dealers here have been again approached to make new quotations. Ferromanganese for delivery next year is quoted at $38.50, Baltimore. Ferrosilicon is in little demand just now, and $64, Pittsburgh, is the quotation for the remainder of the year, with some sales reported to have been made at that figure.

Metal Market

NEW YORK, October 25, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Oct.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
19	12.50	12.50	41.70	4.25	4.15	6.35	6.20
20	12.50	12.50	42.00	4.25	4.15	6.35	6.20
21	12.62½	12.50	....	4.25	4.15	6.35	6.20
23	12.62½	12.50	42.00	4.25	4.15	6.35	6.20
24	12.62½	12.50	41.95	4.25	4.15	6.35	6.20
25	12.62½	12.50	42.05	4.25	4.15	6.35	6.20

A great deal of copper has been sold at higher prices, but all sellers have not supported the full advance made by others. Good quantities of lead have been sold as the result of recent price reductions. Spot tin is a little higher and is moving freely. Spelter continues to advance and is scarce.

Copper.—Large amounts of copper have been sold, but it is hard to estimate how much. The market advanced sharply last Thursday, within a day going up to 12.62½c. for electrolytic. The United Metals Selling Company made its price for electrolytic 12.50c. on Monday, however, and that is the market at the present time. During Friday and Saturday, while the nominal market for electrolytic was 12.62½c., some heavy sales were made, but reports were current of large transactions at 12.50c. Although sellers other than the United Metals Selling Company are now openly asking more than 12.50c. some of them are known to be making quiet sales at around the latter price. The market is very uncertain. The exports so far this month have been large, amounting to 16,886 tons. The London market was easy this morning with spot copper selling at £55 10s. and futures at £56 5s.

Pig Tin.—The feature of the pig tin market this week was the announced change in the rules of the London Metal Exchange which is to be effective on three months' contracts after November 1. Under the new rules deliveries on contracts are not confined to Straits and Australian brands and a schedule of values has been adopted which allows a seller to deliver any brand of pig tin and in case of delivering common tin, where Straits or Australian has been ordered the sale is subject to a rebate of £7 per ton under the contract price. The action of the London Exchange has tended to steady the market, as it is believed that the new rule will be a factor in preventing future corners. Spot tin is decidedly more plentiful here, although it is selling at a higher price than a week ago. Some large sales to tin plate mills were made during the week. This morning pig tin was sold in New York at 42.05c. The London market was firm with both spot and futures selling at £191 12s. 6d.

Tin Plates.—The domestic demand for tin plates is seasonably dull, with 100-lb. coke plates offered at $3.64. Large sales for export are being made and the foreign price is unchanged at 13s. 7½d. for plates at Swansea, Wales.

Lead.—Lead is selling well and recent price reductions have made it apparent that many consumers were short of stocks. The market is reported to be slightly firmer in the West, where outside sellers were cutting prices somewhat. It is believed in some quarters that the recent action of the leading interest in making two sharp reductions in its quotations was prompted with a view to forestalling any reduction in the present lead tariff. We quote the New York market at 4.25c. and St. Louis at 4.15c.

Spelter.—Spelter is very firm and it is difficult to get, as many producers claim to be sold up and dealers are decidedly short. The market is growing stronger and the advance has extended to futures. The fact that in the European market spelter is higher than it has been in many years is influencing the situation here and consumers are excited over the fact that many dealers refuse to quote for deliveries beyond December. The London market is now around £27 10s., which is equal to about 6c. in New York, while the market here is around 6.35c. and in St. Louis 6.20c. The market is fluctuating from day to day and it is hard to make a dependable quotation.

Antimony.—The antimony market continues weak and there is no demand except from the jobbers, who are buying in small lots. Cookson's is now offered at around 8c.; Hallett's, 7.70c., and Chinese and Hungarian grades from 6.75c. up. Hallett's is said to be somewhat scarce.

Old Metals, New York.—Business continues very quiet, with dealers' selling prices nominally unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

OCTOBER 23.—Although the market activity in metals has shown no great increase, a somewhat stronger tone prevails as evidenced by slightly higher prices for copper and tin and the scarcity of spelter for spot shipment. Improvement is also noted in the prices of old metals. We quote at Chicago: Casting copper, 12.37½c. to 12.50c.; Lake, 12.62½c. to 12.75c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin carloads, 43c.; small lots, 45c.; lead, desilverized, 4.25c.

to 4.30c., for 50-ton lots; corroding, 4.50c. to 4.55c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.25c. to 6.30c.; Cookson's antimony, 9.25c., and other grades, 8.25c. to 8.75c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.25c.; red brass, 9.75c.; yellow brass, 7.75c.; lead pipe, 4c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 23.—The lead market has shown a little improvement and the quotation now stands at 4.15c. and quite firm. Spelter eased off during the week, but is firming up again and is now quotable at 6.20c. Tin is up again to 42.45c. Lake and electrolytic copper are both quotable at 12.85c. Cookson's antimony is 8.35c. In the Joplin market there has been considerable activity in blende, the price for zinc sulphide setting the high mark for the year. The assay price reached $45.68 per ton on the 60 per cent. zinc content basis. The top price paid was $49.18 per ton, with $1 premium for low lead content. Open market bids reached $45 per ton, assay basis, with choice lots bringing $48. One lot which has been held for high prices, 3000 tons in all, was sold at a private price. Calamine continued strong at $24 to $25 per ton on the 40 per cent. metallic content basis, the top grades bringing $32 per ton. Lead ore sold at $54 to $56 per ton. On old metals we quote for less than carload lots: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, October 25, 1911.

Among the industrial stocks interest has centered in the past week in United States Steel common and the Great Northern Ore certificates. The latter, which were at 50 on Wednesday, October 18, declined to 40 the next day on the announcement of the expected cancellation of the Steel Corporation lease of the Hill or Great Northern iron lands. There was a slight recovery later and on Tuesday, October 24, the certificates closed at 41½. Steel common, which had been 60⅞ on October 18, dropped to 57⅝ on the following day, but rallied later. The closing quotation on Tuesday, October 24, was 59¾. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	2⅜- 3⅛	Pressed Steel, com.	28½- 29
Allis-Chalm., pref...	9¾- 11¼	Pressed Steel, pref.....	95
Beth. Steel, com....	28 - 28¾	Railway Spring, com.	27 - 27½
Beth. Steel, pref....	55 - 56	Republic, com.....	22 - 23
Can. com.....	9⅞- 10½	Republic, pref.....	84 - 85
Can, pref.....	85½- 86¼	Sloss, com.....	40
Car & Fdry., com...	45½- 50½	Pipe, com.....	12½- 13¾
Car & Fdry., pref...113	-115	Pipe, pref.....	42 - 43½
Steel Foundries	29 - 30½	U. S. Steel, com....	57⅝- 60⅞
Colorado Fuel.....	27 - 28	U. S. Steel, pref....108⅞-	109¾
General Electric.....149	-151½	Westinghouse Elec..	63⅝- 64⅞
Gr. N. Ore Cert....	40 - 50	Am. Ship, pref.....	80 - 86¼
Int. Harv., com....103⅞-	109	Chi. Pneu. Tool....	45 - 46
Int. Harv., pref.....120½		Cambria Steel.....	43⅜- 44½
Int. Pump, com.....	27 - 27¼	Lake Sup. Corp.....	26¼- 27¼
Int. Pump, pref.....	81½- 82	Crucible Steel, com.	10½- 10⅝
Locomotive, com....	33½- 35	Crucible Steel, pref.	76 - 76½
Locomotive, pref....102	-103⅜	Harb. Wk. Ref., pref.	97 - 99
Nat. En. & St., Pref.....	93¾		

Dividends Declared

The National Lead Company, regular quarterly, 1¾ per cent. on the preferred stock, payable December 19.

The Cambria Steel Company, regular quarterly, 1¼ per cent., payable November 15.

The McCrum-Howell Company, regular quarterly, 1¾ per cent. on the preferred stock, payable November 1.

Henry R. Worthington, Inc., subsidiary of the International Steam Pump Company, regular semi-annual, 3½ per cent. on the preferred stock, payable November 1.

Pennsylvania Steel Company, regular semi-annual, 3½ per cent. on the preferred stock, payable November 1.

The Buffalo Forge Company, Buffalo, N. Y., has recently furnished the Bethlehem Steel Company the forced-draft equipment necessary to take care of the increased size of its Saucon plant. The contract calls for a 200-in. standard Buffalo steelplate fan, direct connected to a 10 x 20-in. horizontal side-crank Buffalo steam engine. About 6 years ago, when this plant was built, six similar Buffalo outfits were installed by the company.

Pittsburgh Foundrymen's Association

Eliot A. Kebler, chairman of the Programme Committee of the Pittsburgh Foundrymen's Association, has made the following announcements for the winter and spring meetings of this organization:

November meeting—Prof. J. J. Porter, "Quality of Pig Iron, Its Independence of Chemical Composition and Its Relation to Methods of Manufacture."

December meeting—Brooks J. Goodin, "Coke Districts;" W. E. Weinn and Harvey Cory, "Coal Washing Machinery for Coke Manufacture."

January meeting—"Practical Demonstration of Different Methods of Welding." Meeting to be held in the foundry of the Carnegie Technical Schools."

February meeting—Joint meeting with the Pittsburgh Foundry Foremen's Association. Subject: "Brass."

March meeting—Subject: "Steel."

April meeting—Subject: "Mechanical Appliances in the Foundry."

May meeting—Subject not assigned.

June meeting—Dr. Richard Moldenke, secretary of the American Foundrymen's Association, and H. E. Field, of Pittsburgh, "Molding Sands." This will be the annual meeting of the Pittsburgh Association.

All-Steel Passenger Cars.—The Long Island Railroad Company has just ordered 40 all-steel cars for delivery in 1912, consisting of 15 coaches for steam service, 20 motor and 5 combination baggage and passenger cars. They will be built by the American Car & Foundry Company, and the estimated cost is $500,000. Ninety of the 100 steel cars ordered last year have been received. With the equipment now under construction, this railroad will have a total of 455 all-steel passenger and mail cars, comprising more than half its entire equipment, and representing an outlay of over $7,500,000. If its earnings warrant further large expenditures, at the end of six years the Long Island will have in operation only cars of steel construction for passenger service. All recent orders for new equipment indicate that the transportation systems of the United States are relegating wooden cars to the scrap heap. The Pennsylvania was the first railroad in this country to adopt the all-steel passenger car. Since June, 1900, over 2000 such cars have been placed in its service. Aside from being non-collapsible and fireproof, another valuable feature of the steel car is a central box girder 24 in. wide by 19 in. deep, extending the entire length of the car, which prevents telescoping in collisions.

Machinists' Strike Benefits.—The biennial report of the president of the International Association of Machinists shows that in the two years ending June 30, 1911, the association paid in strike benefits $585,400. From April 1, 1891, to June 30, 1911, the amount paid for strike benefits was $2,410,405. In June, 1911, the membership according to the report was 70,036. However, the total number voting for president at the recent election was only 28,621. If the report of membership is correct, the election, which resulted in the overthrow of the last administration, brought out an exceedingly light vote.

Foreign manufacturers are taking an active interest in the visit of members of the Society of Automobile Engineers to Europe. Many of them have expressed a willingness to open their establishments to the inspection of the party which leaves New York on the Mauretania November 1. The latest invitation is from the famous house of Lemoine in Paris, perhaps the leading manufacturer of motor vehicle axles and forgings in Europe, offering an inspection of the various processes of axle construction during the stay of the members in Paris.

The Society of Automobile Engineers has issued its list of members showing a total of 914, of whom 720 are full members and 100 associate members. Henry Souther, president of the Henry Souther Engineering Company, Hartford, Conn., is president. The headquarters of the society are at 1451 Broadway, New York; Coker S. Clarkson, secretary and general manager.

The Ready Tool Company, Bridgeport, Conn., has purchased the entire business of the M. B. Hill Mfg. Company, Worcester, Mass., maker of milling machine and lathe dogs.

Personal

A cablegram from Peking says that Charles M. Schwab has started to return to the United States and that the rebellion has prevented the completion of his negotiations with the Chinese government for battleship work.

Jennings S. Cox, Jr., Santiago de Cuba, general manager of the Spanish-American Iron Company, and Pedro Aguilera, also connected with the company, were taken by a party of bandits near one of the Cuban iron ore properties October 13 and held for a ransom. Mr. Cox was released in order to secure the money. Later a party of armed men captured the bandits and released Aguilera.

The name of the town of South Sharon, Pa., has been changed to Farrell in honor of President James A. Farrell, of the United States Steel Corporation.

Charles F. Huhlein, for 22 years general manager and for eight years also vice-president of B. F. Avery & Sons, Inc., Louisville, Ky., has been elected president to succeed the late George C. Avery. William Black, secretary of the company, who has been connected with it for 18 years, has been elected a director and vice-president. Thomas C. Humphries, auditor, has been elected secretary.

Edward B. Busby, formerly with the Electric Welding Products Company, Cleveland, Ohio, has been made sales manager of the Anderson Forge & Machine Company, Detroit, Mich.

C. D. Chasteney has resigned his position as sales manager of the De Laval Steam Turbine Company, Trenton, N. J., having acquired an interest in the Turbine Equipment Company, 30 Church street, New York, which represents the De Laval Company in New York State, parts of New Jersey and Connecticut. He has been with the De Laval Steam Turbine Company since the organization of the American company over 10 years ago.

J. J. Wood, factory manager of the Fort Wayne Electric Works, Ft. Wayne, Ind., has returned from a three months vacation in Europe. While abroad he secured the American rights for the manufacture of a French electrical ice-making machine. It will be redesigned and built at the Ft. Wayne works.

Alexander E. Outerbridge, Jr., will present a paper at a meeting of the various sections of the Franklin Institute, Philadelphia, on Thursday evening, October 26, on "A Practical Application of Fluorescence in Testing Oils for Industrial Purposes."

Andrew Carnegie returned to New York from Scotland October 20.

A. R. Roy, of the Swedish Iron & Steel Corporation, 12 Platt street, New York City, read a paper on "Swedish Steels" before the New York Railroad Club on the evening of October 20.

At the annual meeting of the Republic Iron & Steel Company, October 18, the following were elected directors for the term expiring in 1914: Edward J. Berwind, Harry Bronner, Charles G. Gates and Grant B. Schley. Mr. Gates succeeds his father, the late John W. Gates.

George W. Greene, formerly Pittsburgh manager of the American Bureau of Inspection and Tests, has severed that connection and is now associated with the Hildreth-Jones Company of Chicago and Hildreth & Co. of New York, in the capacity of mechanical engineer.

E. A. Johnson, Eastern sales manager for the Duff Mfg. Company, has been appointed general sales manager with headquarters at the company's main office in Pittsburgh. C. A. Methfessel has been appointed Eastern sales manager to succeed Mr. Johnson, with headquarters at the company's office, 50 Church street, New York.

George C. Smith, for about 10 years in charge of auxiliary organizations of the Westinghouse interests at Pittsburgh, has resigned, and has been succeeded by Calvert Townley, assistant to the president of the Westinghouse Electric & Mfg. Company. Mr. Smith will now give his entire time to other enterprises in which he is interested. He is a member of the engineering and construction firm of James Stewart & Co., and also the New York representative of the Canadian Syndicate, Ltd., of Montreal and Toronto.

W. P. Snyder, Jr., has been appointed assistant to President W. P. Snyder, Sr., of the Shenango Furnace Company, Oliver Building, Pittsburgh. He is now on a trip to upper Lake ports on the new ore boat James M. Schoonmaker, recently launched.

C. P. Wadsworth, for 23 years chief engineer of the W. J. Rainey Coke Company in the Connellsville coke region, has resigned, effective November 1. He has not made plans for the future.

Obituary

A. R. Treadway

Augustine R. Treadway, widely known as one of the oldest and leading hardware manufacturers in the country, and until recently president of the Peck, Stow & Wilcox Company, died from heart failure at his home in Cleveland, Ohio, October 16, aged 75 years. He was born in New Haven, Conn., from old New England stock. After leaving the public schools he went to Philadelphia, where he was employed as a clerk in a business conducted by relatives. On becoming of age he returned to New Haven and engaged in the stove, furnace and steam heating business in partnership with an uncle under the firm name of Treadway & Warner, later becoming L. & A. R. Treadway. He was actively interested in this business for some 20 years. About 1873 he became manager of the Aetna Nut Company, Southington, Conn. That company was in bad financial condition at the time, and he succeeded in putting it on its feet.

In 1879 Mr. Treadway moved to Cleveland and organized a hardware manufacturing concern under the name

A. R. TREADWAY

of Willcox, Treadway & Co., his associates being William Willcox, M. B. Willcox, S. W. Sessions, I. P. Lamson and Thomas H. Lamson. Mr. Treadway was manager of the business of the firm which later was incorporated as the Willcox & Treadway Company. In 1881 it was consolidated with the Peck, Stow & Wilcox Company, which at the time was an old-established concern engaged in the manufacture of hardware and tools. In addition to its Cleveland plant this company has plants in Southington, Conn., where its main offices are located, and at Plantville and East Berlin, Conn., and offices and warehouses in New York City. On the consolidation Mr. Treadway became manager of the Cleveland works of the company, and in a short time was elected vice-president. In 1899 he became president, which position he retained until last July, when he resigned because of advancing years and was succeeded by his son, Lyman H. Treadway, who at the time was vice-president and manager of the Cleveland

works. He was also a director in the Union Rolling Mill Company, Cleveland, and was associated with three Cleveland banks as director. He was a member of the Cleveland Chamber of Commerce. He leaves a widow, three sons and a daughter. His sons are Lyman H. Treadway and Francis W. Treadway, of Cleveland, the latter recently lieutenant-governor of Ohio, and Charles F. Treadway, of New Haven, Conn.

Robert Mather

Robert Mather, chairman of the board of directors of the Westinghouse Electric & Mfg. Company, died at his residence in New York City, of peritonitis, October 24, aged 52 years. He was born at Salt Lake City, Utah. At the age of 13 he entered a factory, working three years to learn how telegraph instruments and switchboard apparatus were made. Later he obtained his first railroad experience in the office of the master mechanic of the Chicago, Burlington & Quincy Railroad. While working there he managed at nights to prepare for college, and in 1882 he was graduated from Knox College. Three years later, still studying nights while he worked by day at railroading, he obtained his master's degree at the college. From 1882 to 1885 he worked in the treasurer's office of the Chicago, Burlington & Quincy, devoting his spare time to the study of law, and in 1886 he was admitted to the Illinois bar. In 1889 he became local attorney at Chicago for the Chicago, Rock Island & Pacific Railroad, and in 1902 he was made general counsel for the road, becoming its president in 1904. In January, 1909, at the time of the reorganization of the Westinghouse Electric & Mfg. Company, he was elected chairman of its board of directors and thereupon severed his railroad connections. At the time of his death he was director of the La Grange Mining Company, S. S. McClure Company, Equitable Life Assurance Society, Mercantile Trust Company, Havana Electric Railway Company, Westinghouse Lamp Company, Canadian Westinghouse Company, R. D. Nuttall Company, Niagara, Lockport & Ontario Power Company, Perkins Electric Switch Mfg. Company, Bryant Electric Company, National Bank of the Republic, of Chicago, Chicago, Rock Island & El Paso Railway Company, and general counsel of the Chicago & Alton Railroad Company.

The Connellsville Coke Trade

The condition of the Connellsville coke trade is reported as follows by the Weekly Courier, Connellsville, Pa.:

The Connellsville coke trade figures for last week indicate that there is a slight falling off in production and shipments, but not a sufficient one to be significant. In the face of this fact is the further information that the active oven list is increasing, slowly to be sure, but positively as a fact. The merchant coke trade of the Connellsville region is being murdered by the assassins of insane competition. So violent has become their price-cutting competition that consuming interests have ceased to contract, finding better terms in the open market. Production last week showed a decrease of 4138 tons as compared with the week before, the total being 310,205 tons against 314,343 tons. The output of the furnace ovens fell off 2700 tons, the total being 176,466 tons as compared with 179,166 tons the preceding week. The output of the merchant ovens was 133,739 tons as against 135,177 tons, a decrease of 1438 tons. A total of 26,166 ovens was in operation. The number of active ovens was increased by the firing of 169 ovens at Low Phos, and decreased by the blowing out of 2 ovens at Burchinal, 10 at Katherine, 25 at Washington No. 1 and 25 at Washington No. 2, making a net increase of 107 ovens.

To Discuss Relation of Government to Business

The relation of government to business is to be made the general topic of a dinner meeting on Friday evening, November 10, at the Hotel Astor, New York City, of the Academy of Political Science in the City of New York. The guests of honor are Judge Elbert H. Gary and Attorney-General George W. Wickersham. Robert Mather, whose sudden death is announced elsewhere on this page, was to be one of the speakers, the list of which includes Senator Albert B. Cummins, of Iowa, John Hays Hammond and George W. Perkins.

The dinner is one of the sessions of the annual meeting of the Academy. The first session takes place at Columbia University, 2.30 p. m., November 10, and its topic is the improvement of labor legislation. Those to discuss the question include P. Tecumseh Sherman, former commissioner of labor, New York; Miles M. Dawson, Prof. Henry R. Seager, of Columbia University; Prof. Edward T. Devine, Columbia University; John Calder, Remington Typewriter Company; Mrs. Florence Kelley, National Consumers' League, and Dwight W. Morrow, of the New York Bar. A session to discuss social efficiency in business is to be held at Columbia University, 10.30 a. m., November 11. The speakers include Prof. Irving Fisher, Yale University; Raynal C. Rolling, assistant general solicitor, United States Steel Corporation; Dr. G. W. Price, New York State Factory Investigating Commission, and Mrs. John Hays Hammond. The last session, 2.30 p. m., November 11, at Columbia University, is to consider financial facilities for wage earners.

Among the trustees of the Academy are President A. Barton Hepburn, Chase National Bank; Thomas W. Lamont, of J. P. Morgan & Co., and President Frank A. Vanderlip, National City Bank, New York, and the personnel of the advisory council is President Nicholas Murray Butler, Columbia University; J. Pierpont Morgan, Senator Elihu Root and Francis Lynde Stetson.

Correction.—The Titanium Alloy Mfg. Company, 1225-1226 Oliver Building, Pittsburgh, Pa., calls attention to an error which appeared on page 849 of *The Iron Age* of October 19. The statement is there made that "during 1910 the quantity of rails treated with titanium was 326,316 gross tons." The word "rails" should have read "steel," as this tonnage refers to the entire quanuty of Bessemer, basic open-hearth and acid open-hearth steel treated with titanium.

The opening session of the American Mining Congress, at the Hotel La Salle, Chicago, Tuesday afternoon, October 24, witnessed a first day enrollment of nearly 300. The attention of this, the fourteenth annual, meeting is to be given in a great measure to matters pertaining to coal mining. The programme, however, is exceedingly diversified and will feature addresses by John Hayes Hammond on "Mining as an Investment"; Walter L. Fisher, Secretary of the Interior, on "The Alaskan Situation" and President Taft on "The Federal Government and the Mining Industry." A number of other men of national reputation are appointed to present subjects for discussion. The final meeting will be held on Saturday evening at which the President will speak.

A notably quick shipment of an equipment of pumps has been made by the Blake & Knowles Steam Pump Works, 115 Broadway, New York. A fire recently destroyed the pump house with contents of the Atlantic Creosoting & Wood Preserving Works, Norfolk, Va., putting the entire plant out of commission and subjecting the company to a large daily loss owing to unfilled contracts. The pumping equipment, consisting of one carload, was shipped in three days after the order was placed. It comprised vacuum pumps, pressure pumps and tank pumps for handling creosote oil and also a large air compressor.

The Hess-Bright Mfg. Company, Twenty-first street and Fairmount avenue, Philadelphia, Pa., maker of ball bearings, states that it has been advised by the Deutsche Waffen und Munitionsfabriken that the DWF bearings have been awarded the Gran Premio at the Turin Exposition, now being held at Turin, Italy, this being the highest distinction. The Hess-Bright Company is importer for the German company.

The Pollak Steel Company, Cincinnati, announces that it succeeds the Block-Pollak Iron Company in the manufacture of open hearth steel railroad car and locomotive axles, also special heat-treated axles and forgings for cars and locomotives.

To Cancel the Hill Ore Lease

The Steel Corporation Will Also Reduce the Rail Rate on Ore

The announcement has been made in the past week on the authority of the United States Steel Corporation, though no officer of the corporation is directly quoted, that it will cancel its lease of the Great Northern iron ore properties and that it will reduce the freight rate on iron ore carried by its two Minnesota range railroads to 60 cents a ton. As indicated in the exhaustive and timely article, "The Great Northern Iron Ore Lease" which appeared in *The Iron Age* of October 19, page 854, the lease may be terminated on January 1, 1915, provided notice is given two years before that date. The intimation which the Steel Corporation has now given comes more than 14 months in advance of the specified time and is to be construed therefore as having a further purpose than that of simple notification. In view of the publicity recently given to the Government's attitude toward the Steel Corporation and to the very large proportion of Lake Superior ores controlled by the corporation, the announcement of the decision to cancel the ore lease is given special significance. It has been interpreted by some writers in the past week in the light of the following extract from the "Summary of the Report of the Commissioner of Corporations on the Steel Industry," by Herbert Knox Smith, of which Part I was published in July last:

The Steel Corporation's Control of Ore

The system of leasing ore mines, as employed in the Lake region, is important in this connection. A very large part (approximately two-thirds in 1910) of the corporation's total holdings in the Lake region is held by lease. Frequently there is no initial investment in such leaseholds, and even where a bonus is paid it is usually small, while the minimum tonnage on which royalty must be paid, whether mining operations are conducted or not, is generally unimportant. The Hill lease is, of course, a very marked exception in both respects.

It will be seen, therefore, that this ore-leasing system, where there is no limit placed on the number of leases that can be combined under a single interest, greatly facilitates the gathering in by a great concern like the Steel Corporation of a vast amount of ore reserves, far in advance of any commercial need for them. This not only prevents others from getting such property but also secures to such a concern the benefit of any appreciation in value which may come about either from natural causes or as a result of this very concentration of ownership. Obviously, a system which thus lends itself to such marked concentration of ore property for many years in advance (a common term of lease being 50 years), at a comparatively small cost, involves questions of the highest public importance. It might be said that the lease system as thus applied in the Lake ore region really affords an opportunity for a wealthy interest to attempt a corner in ore reserves on what is, in effect, a margin basis. Of course, in such extensive acquisitions there is a decided speculative risk, just as in similar efforts to control commodity markets, particularly the possibility of the discovery of available deposits elsewhere or new methods of mining which may render what are now non-available ores available for present commercial purposes.

The dominating position in the ore industry enjoyed by the Steel Corporation through this great ownership of ore reserves is hightened because of its very marked degree of control of the transportation of ore in the Lake Superior district. The corporation owns two of the most important ore railroads, the Duluth & Iron Range Railroad and the Duluth, Missabe & Northern Railway. The ore rates on these railroads are about 1 cent per ton-mile. Their operating expenses are very low, that of the Duluth, Missabe & Northern in 1910 being below 30 per cent. of gross earnings as against an average of 66 per cent. for all the railroads of the country. The net earnings of these ore railroads, which are chiefly from the ore traffic, are phenomenal. This has the practical effect of reducing the Steel Corporation's net cost of ore to itself at upper Lake ports and, on the other hand, of increasing that cost to such of its competitors as are dependent upon the corporation's railroads for transportation.

Hence, not only on account of its great holdings of ore but also on account of these peculiar advantages enjoyed in the transportation of the ore the Steel Corporation occupies an extremely commanding position in the iron and steel industry. Indeed, in so far as the Steel Corporation's position in the entire iron and steel industry is of monopolistic character, it is chiefly through its control of ore holdings and the transportation of ore.

The High Ultimate Royalties on Hill Ore

Leaving out of consideration the time chosen for the announcement, one of the chief reasons for the decision to cancel the Hill ore lease is no doubt the conclusion reached that it imposed a burden of cost that should not be borne longer than necessary. The article in last week's *Iron Age* brought out very plainly the high royalties which would have to be paid in the later years of the lease. As has been repeatedly stated, any reduction in freight rates on the Minnesota ore rates would be added to the royalty in the case of ore mined by the Steel Corporation under the Great Northern lease. The final paragraph of the article referred to showed that the Steel Corporation in 1946 would pay a royalty amounting to $2.176 per ton on a 59 per cent. ore, provided the freight rate remained at 80 cents. If the freight rate from the mine to upper Lake dock should be reduced at any time from 80 cents to, say, 50 cents the royalty would go to $2,467, or a charge for royalty alone of more than $5 a ton on steel made from this ore.

It has been stated by the Hill interests in the past week that no intimation had yet been received by the Ore Trustees of the Great Northern Railway that the Steel Corporation lease would be terminated. It is to be expected that when the formal notification is made an official statement will be made on behalf of the Steel Corporation.

As was shown in our article of last week the minimum to be produced by the Steel Corporation in 1911 from the Great Northern properties is 3,750,000 tons at a royalty rate of 98.6 cents a ton. It was shown also that the deficit on the minimum requirements of the lease amounted to 5,683,191 tons at the end of 1910. In order to make this up in 1911 and 1912, the corporation would need to mine about 7,000,000 tons of Hill ore (or one-third its total production) in each of the two years. In the three years the lease will still run the minima of the Steel Corporation will be 4,500,000 tons, 5,250,000 tons and 6,000,000 tons, respectively. On the last-named amount, which must be mined in 1914, the royalty will be at the rate of $1.088.

The Reduction in Ore Freights

As to the reduction on ore freights, it is stated that it will be effective in thirty or forty days, and the conclusion is that it will apply to shipments in 1912. As this reduction by the Steel Corporation will be followed by a reduction on the Great Northern freight rate to Superior, the royalty on the Steel Corporation's Great Northern ore in 1914 would amount to $1.288 a ton. The present rate on iron ore is 80 cents per gross ton from all Mesaba Range points to Duluth. The rate covers all shipping points on the Duluth, Missabe & Northern Road and all the Mesaba Range points on the Duluth & Iron Range Railroad. From Tower on the Vermilion range, on which all the shipping mines but one belong to the Steel Corporation, the rate is 90 cents to the docks at Two Harbors, and from Ely it is $1. When the proposed change takes effect there will be a flat rate of 60 cents a ton from all points on the two ranges.

The question arises whether the 20 cents reduction in ore freights will be acceptable to ore shippers and to those officially charged with supervision of railroad rates. The last effort to secure a reduction in the rate on Minnesota iron ore from the mine to Lake Superior dock was through a case brought before the Minnesota State Railroad Commission. This case was taken into the courts and it was held that the carrying of lake ores was interstate commerce; that the Minnesota ore road was but one link in the chain of transportation, which included also the Lake haul and that by rail from lower Lake port to the blast furnace. Under this decision it followed that the State Railroad Commission had no jurisdiction over the ore rate.

Railroad Equipment Orders.—The Baltimore & Ohio Railroad's order for 4500 freight cars, which has been under consideration for weeks, is about to be placed. The Pennsylvania is in the market for 300 tank cars and has ordered 35 coaches and 17 combination passenger cars from the Pressed Steel Car Company and 30 coaches from the American Car & Foundry Company. The new York Central has ordered 2000 steel underframe box cars from the American Car & Foundry Company and 30 Pacific-type locomotives from the Baldwin Locomotive Works. The Southern Railway is inquiring for 500 all steel gondola cars and 50 steel underframe box cars. The Canadian Northern Railway Company has ordered 1000 wooden box cars from the Nova Scotia Car Company.

Uses of Blast Furnace Gas

Results in the Open Hearth Furnace, When Mixed with Coke Oven Gas

In his dissertation for the degree of doctor of engineering, presented at the University of Breslau, Rudolf Buck discussed at length the "Uses of Blast Furnace Gas."* After a brief historical introduction he takes up the subject under the following headings:

1. The uses of blast furnace gas in well known ways, with special consideration of the latest developments.
2. The blast furnace gas burner.
3. The use of blast furnace gas in the foundry.
   (a) In pipe foundries.
   (b) In ordinary foundries.
4. Its use in open hearth furnaces.
5. Its use for the heating of coke ovens.

Especial stress is laid on the suitability of blast furnace gas for use in the foundry, for drying molds of all kinds, heating ladles, etc. Many tests have been made of the gas alone, and when mixed with coke oven gas, and also of hot air from the blast furnace stoves. Coke oven gas, because of its large percentage of hydrogen, is not suitable for foundry use. For instance, in drying a pipe mold the lower part is well dried, but the water produced from the hydrogen when burnt condenses in the upper part and keeps it moist. Because of this, coke oven gas either alone or mixed with blast furnace or producer gas should not be used for foundry work. Hot air from the stoves is not economical, as the blast furnace gas can be burned more profitably directly in the foundry. Waste gases from the stoves and boilers are not suitable, because of the great variation in temperature.

Methods of Cleaning the Gases

The composition of the blast furnace gas is briefly considered, and then its purification is taken up. Emphasis is laid upon dry cleaning, brought about by sudden changes in the direction of the gases, and by reducing the velocity by increasing the area of the pipes. The so-called dust pockets are for this latter purpose; they also serve to uniformly lower the temperature. It is not impossible that the change in volume caused by the drop in temperature has an important influence on removal of the flue dust. The most suitable construction for these dry purifiers has not yet been decided upon, many different types being experimented with. The main thing is to build them with the greatest possible diameter in order to bring about the greatest possible lowering in velocity.

An example may be taken from practice. The dry cleaner is 65 ft. 7½ in. high and 27 ft. 10½ in. diameter. The incoming gas has an average velocity of 19.7 in. per second, and the highest value is 31.5 in. per second. The dust was from 2.6 to 3.5 grains per cu. ft. and the temperature 390 deg. F. The gas left with a temperature from 170 to 212 deg. F. and from 0.65 to 0.78 grain of dust per cu. ft. This corresponds to 60 deg. lowering of the amount of dust. It is impossible, however, to use this roughly cleaned gas direct in gas engines. To-day gas cleaning is divided into rough and final cleaning. The first is divided into dry and wet rough cleaning. The latter, that follows the rough cleaning, is divided into wet cleaning in fans or centrifugal washers and dry cleaning with filters and fans. The most important thing about wet cleaning is that it is necessary to reduce both the dust and the water as low as possible and also to cool the gas to a minimum. These subjects are dealt with briefly, the author favoring centrifugal washers for removing the very fine dust. He complains, however, of the cost of effecting wet cleaning by whatever system.

Advantages of Cleaned Gas

The advantages of cleaning the gas are given as follows:

1. The troubles brought about by pipes being stopped up with flue dust are either removed entirely or reduced to a minimum.
2. The volume of the gas is greatly reduced, whereby the pipes may be made smaller, thus bringing about lower erecting costs.
3. The steam in the gas is condensed and separated.
4. The gas is more easily lighted and burnt.
5. The heating value of the gas is increased and its efficiency greater for any kind of use.
6. The operation of stoves and boilers is more regular.
7. The cost of cleaning pipes and tubes is lower and the furnace will not have to stop so often.
8. The cleaning of the stoves, bringing about loss of heat, will not be necessary so often and the unfavorable action on the brick work through cooling and cleaning will be less.
9. The life of the whole apparatus will be considerably increased and the cost for material will be less.
10. The heating surfaces in the stoves being cleaner the efficiency will be greater. This means saving of gas.
11. The operation of the gas engines will be more certain.
12. Electrical energy can be produced by means of gas engines and the excess over requirements can be sold to neighboring works or communities.
13. Thorough final cleaning of blast furnace gas makes its use possible in open hearth furnaces, in mixers, for drying operations, in foundries, for heating furnaces in rolling mills, etc.
14. It can be used to heat coke ovens, the dearer coke oven gas being sold in large part for lighting purposes.

These advantages are not brought about by removing the dust only, but also by cooling and reducing the water to the lowest possible amount. The drying of the gas can hardly be effected except by vigorous cooling, when the maximum amount of steam is condensed and separates as water. Practice has shown that the loss of heat through cooling is not so great as the poor efficiency brought about by wet gas.

The use of blast furnace gas in engines, stoves and boilers is briefly taken up, and then comes an important section on burners. These burners are designed to give as complete combustion of the gas as possible, and flames of various shapes to suit operations in the foundry. This section of the paper is illustrated with drawings of the burners and photographs of the flames. It is followed by a well-illustrated section on the use of the gas in the foundry.

Blast Furnace Gas in the Open Hearth

Producer gas can be replaced by coke oven gas, or better still by a mixture of coke oven and blast furnace gas. The mixture should be in such proportion that the gas is from 179 to 213 B.t.u. The amount of gas necessary for the operation, which depends on the size of the furnace and the stage of the process, is easily regulated by valves in the separate gas pipes. Tests have been made at Friedrich-Wilhelms Hütte in Mülheim-on-the-Ruhr, and for over two and a half years two acid furnaces of 12 to 15 tons have been heated successfully. The process can be carried out with blast furnace gas alone, but it takes so long that the quality of the steel can easily be impaired. With the use of the mixed gases, on the other hand, the operation is not only quite as successful as with producer gas, but is carried on more quickly and to better advantage. A mixture of coke oven and blast furnace gas in about the proportion of 1 to 4 is necessary, so that the coke oven gas is added to the other before coming to the reversing valve.

In Friedrich-Wilhelms Hütte the blast furnace gas is brought from the furnaces in an elevated pipe line 23.6 in. in diameter; the coke oven gas comes in an underground pipe line 9.8 in. in diameter. The arrangement of the furnace and the size of ports and checkers are the same as when using producer gas. Details are given of the six test heats, illustrated by diagrams.

In Test No. 1 the mixture was in the ratio of 1 to 4 and the average heating value of the mixture was 213 B.t.u. per cu. ft. Its analysis gave 5.4 per cent. CO_2, 0.2 per cent. O, 18 per cent. CO, 28.5 per cent. H_2, and 5.1 per cent. CH_4. Temperature measurements made on the furnace after the charge was melted varied between 1744 and 1900 deg. C. These were taken with a Wanner pyrometer through the middle door. Details are also given, both for this and the other heats, of the temperature and composition of the waste gases and the temperature of the heating gases, both taken in the checkers. The analysis of the finished steel was 0.224 per cent. C, 0.049 per cent. S, 0.062 per cent. P, 0.52 per cent. Mn and 0.18 per cent. Si.

*Reproduced in Stahl und Eisen, issues of July 20 and 27 and August 3, 1911.

In the second test the mixture of gases was in the ratio of 1 to 4.5. The average heating value was 186.8 B.t.u., and the analysis gave 4.2 per cent. CO_2, 0.8 per cent. O, 16 per cent. CO, 29 per cent. H_2 and 3 per cent. CH_4. The analysis of the finished steel was very similar to the one given above, and the temperature of the furnace varied from 1640 to 1900 deg. C.

In the third test the mixture was again in the ratio of 1 to 4. The analysis of the mixture gave 4.4 per cent. CO_2, 0.6 per cent. O, 15 per cent. CO, 36.7 per cent. H_2 and 4.2 per cent. CH_4. The average heating value was 199.3 B.t.u. The furnace temperatures varied from 1692 to 1900 deg. C, and the analysis of the final steel was 0.28 per cent. C, 0.053 per cent. S, 0.067 per cent. P, 0.49 per cent. Mn and 0.18 per cent. Si.

The fourth test was not continued long enough to get the finished steel. Blast furnace gas alone was used. Its analysis gave 8.8 per cent. CO_2, 0.2 per cent. O, 31.0 per cent. CO and 2.1 per cent. H_2. The average heating value was 112.3 B.t.u. The furnace temperature during the period of testing varied from 1478 to 1549 deg. C.

The fifth test also did not last very long. The mixture was in the ratio of 1 to 6.5. The average heating value was 162.9 B.t.u., and the analysis gave 5.8 per cent. CO_2, 0.6 per cent. O, 19.2 per cent. CO, 21.2 per cent. H_2 and 2.3 per cent. CH_4. The furnace temperature varied from 1494 to 1640 deg. C.

In the last test the mixture was in the ratio of 1 to 3. Its analysis gave 3 per cent. CO_2, 0.2 per cent. O, 11.2 per cent. CO, 38.2 per cent. H_2 and 5.5 per cent. CH_4. The average heating value was 224.7 B.t.u. The temperature of the furnace increased to a maximum of 1900 deg. C. The analysis of the final steel is not given. The samples of gas for analysis were taken about half way through each test, and carefully analyzed with the Orsat apparatus. They were taken just before entering the reversing valve. The unusually low value for methane, compared with the hydrogen of the mixed gas, can not be explained. The coke oven gas had on the average 1.5 per cent. CO_2, 7 per cent. CO, 42 per cent. H_2 and 24 to 28 per cent. CH_4. The blast furnace gas has been given already. The results of analysis, however, cannot be questioned.

Blast furnace gas is also used with success to heat an annealing furnace for steel castings. This furnace is so arranged that blast furnace-coke oven mixed gas or producer gas can be used.

The tapping spouts of the open hearth furnaces are also heated with blast furnace gas.

The paper closes with a description of the way in which blast furnace gas may be used in by-product coke oven practice, thus setting free more of the rich coke oven gas for lighting purposes. G. B. W.

Views on Titanium in Iron and Steel

In a paper read before the American Electro-Chemical Society at its Toronto meeting, Charles V. Slocum reviewed briefly the use of titanium alloy in iron and steel, quoted from a number of authorities on the subject and paid a tribute to Auguste J. Rossi as accomplishing a triumph in that he should take an element so long considered useless and make out of it "so wonderful a servant in the iron and steel industry." A few of the notes regarding the application of the alloy have been taken from the paper together with the quotations from students of the subject.

Titanium alloy is best added to the ladle of steel after tapping from the furnace and before the slag begins to run. For open-hearth steel the supply should be placed convenient to the ladle and shoveled in precisely as so much coal. For soft steel an addition equivalent to 0.03 per cent. titanium is sufficient to make the steel more ductile. Larger quantities are of increased benefit, but cannot always be added because of the carbon content and also because of the density imparted to the steel, which increases as the proportion of alloy is increased, and therefore is not always desirable. In high-carbon steels this increased density is desired and more alloy is used. The addition of the alloy permits the use of a considerably higher carbon content without increasing the brittleness, and several railroads are now using as much as an equivalent of 0.10 per cent. titanium or more in securing tough, durable rails. In the crucible practice the best results have been obtained by adding the titanium alloy to the pots before they are removed from the furnace, giving more time for washing and deoxidizing before teeming.

Titanium as a Deoxidizer

Leading authorities seem to agree that titanium achieves its remarkable results through its strong deoxidizing powers together with its effect of giving the slag formed sufficient fluidity to completely separate it from the metal.

"The presence of titanium oxide lowers the melting point of slags occluded in iron and steel and imparts thereto sufficient fluidity to account for their elimination."[1]

"Titanium * * * has a stronger affinity for oxygen than have the well-known deoxidizers; * * * it probably gives the slag such a consistency that it separates more completely from the molten iron."[2]

"The treatment of all steels with ferrotitanium for the purpose of purifying the metal is strongly recommended, the presence of nitrogen to the extent of 0.02 to 0.035 or 0.045 in certain steels being enough to cause the metal to break asunder, destroying all elongation and reduction of area."[3]

"The great affinity of oxygen and titanium is an absolutely sure means of completely deoxidizing the steel, the advantages of which need no further elaboration. It has been proved that an ingot of steel containing a very small quantity of titanium will show practically no segregation."[4]

The cost of treatment with titanium varies from a minimum of 25 cents to a maximum of $2.00 per ton of metal treated. The amount to be used is very small, and should be proportioned according to the carbon content of the steel and to the amount of impurities present.

[1]Bradley Stoughton, U. S. Patent Office Proceedings, Ser. No. 463610.
[2]Henry M. Howe. Ibid
[3]H. le Chatellier. Paper, Congress of Metallurgists, Belgium, 1905.
[4]E. von Maltitz. Stahl und Eisen. No. 41. 1909.

Locomotives to Tow Ships Through Panama Canal

A new system of towing will be employed in taking vessels through the Panama Canal, according to specifications shortly to be issued by the Government calling for 40 electric locomotives to be used on the work. The system is the invention of Edward Schildhauer, of the canal engineering staff, and it is to be patented with the proviso that the Government be entitled to use it without remuneration. It is planned to utilize the locomotives for taking the vessels through the locks at the rate of two miles an hour. The vessel to be towed will be held between four lines of taut hawsers. The hawsers are to be attached to the windlasses of four locomotives operating on the lock walls, two forward towing and two aft being towed by their hawsers, thus holding the ship steady.

The locomotives are run on a level, except where they pass from one lock to another, at which point they will climb exceptionally heavy grades. There will be two sets of tracks along the lock walls, one for the return of unattached towing engines. The tracks will be of the 5-ft. Panama Canal gauge laid on 90-lb. Bessemer rails on Carnegie steel ties. Each locomotive will consist of three parts, two tractors with a windlass between them. The windlass will be mounted on a truck and joined to each tractor by a drawbar and trunnion, having the effect of a universal joint. The windlass will have two speeds, one for coiling the line under a load and another for coiling an unattached line. Full specifications showing the mechanical details of both tractors and windlasses will be issued from the Washington office of the Canal Commission.

Pipe threading dies have come in for special attention at the hands of the National Tube Company, Pittsburgh, Pa. What constitutes a properly made die and what such dies will do in relation to satisfactory cutting of both steel and wrought pipes are some of the points taken up. The treatment of the subject is not without its parallel to that of tools for cutting metal at high speed. To aid in the campaign of education, the company has prepared some illustrations showing among other things the so-called lip of the cutting edge of the pipe threading chaser, in its Bulletin No. 6.

Ingot Molds of Steel

Stahl und Eisen for August 10, 1911, has a short article on steel ingot molds, by A. Thiele, of Rothe Erde. The experiment of replacing cast iron molds by steel is very recent and not many results have been obtained. So far as the writer knows these results have not been very encouraging. The chief defect has been that after a few heats the molds deteriorate, the cross-section changes and they become useless for further work. Using different kinds of steel did not obviate this difficulty. Mr. Thiele finally succeeded in solving the problem by reinforcing the deterioration zones by suitable sections that were cast in the body of the metal. These sections balanced the tendency toward contraction because of their moments of resistance and greater transverse strength as compared with cast iron.

Molds produced by this process, which is protected by German patent No. 224,122, stand 250 heats on the average, sometimes much more; they give good cause, therefore, for considering the replacement of iron molds for square ingots with steel. The number of heats a mold will stand is not always a good measure of its superiority. The molds mentioned above lost 8.8 to 11 lb. per ton of steel, which was about 6.6 lb. per ton better than with the old iron molds. It is well known that the lower part of iron molds is often badly attacked, whereby the bases of the ingots are enlarged, often causing broken rolls and other troubles. These bad conditions are completely removed by the use of steel molds, for the lower part remains of the same section throughout their life, and if they are well taken care of the ingots remain nice and clean.

As to the economy of using steel molds, this depends largely on local conditions. The simplest case is to take the steel and iron molds as costing the same and estimate what a saving of 6.6 lb. per ton of steel amounts to. In many cases, however, the molds can be made cheaper than those of gray hematite iron, and when used up they are worth more as scrap. The molds are made in much the same way as those of cast iron. For reinforcement I-beams 2.35 in. or mine rails 2.56 in. were used. These were cut in lengths of about 27 in. and placed on each of the four sides lengthwise in groups of three parallel to each other. They were fastened in the foundry mold with nails, so that on the outer side of the finished mold they would be exposed to the air and would be covered on the inner side with a layer of steel from 0.6 in. to 0.78 in. thick.

After training the foundry workmen a perfectly satisfactory casting was produced. Either basic open hearth or Bessemer low carbon steel was found to be suitable. When using the molds water cooling ought to be avoided if possible. Molds produced in this way have no thicker walls than the old iron ones and already after standing 200 heats have lost only 11 lb. per ton of steel.—G. B. W.

French Iron Ore Production in 1910

According to official statistics just published by the French Government, the production of iron ore in France last year amounted to 13,264,715 metric tons, or 2,591,745 tons more than in 1909. The gain, which was equal to 24 per cent., was chiefly in the new Briey basin, which has steadily been rising in importance for some years and already furnishes nearly two-thirds of the entire French ore production. Last year's production in that basin rose to 8,567,100 tons, aginst 6,340,478 tons in 1909, and 4,580,233 tons in 1908.

The exports of ores from France last year to Germany amounted to 1,292,000 tons, and to Belgium 2,874,000 tons—much the largest part of which was from the Briey basin. Not less than 11 great German companies have acquired ore lands there, comprising about 15,000 acres. These are the Gelsenkirchen Company, Krupps, Burbacher, Hörder, Hoesch, Phönix, Thyssen, Rombach, Röchling, Gebrüder Stumm and Aumetz-Friede. There is a heavy demand for the Briey ores in Germany and Belgium for the reason that they are considerably richer than those of Lorraine and Luxemburg, though these latter belong geologically to the same formation.

The competition of the Briey ores has already made itself severely felt in Luxemburg, where the local ore production dropped from 7,492,000 tons in 1907 to 5,714,000 tons in 1909. In 1910 there was a gain of 500,000 tons owing to the activity in the iron industry. It is certain that the imports of Briey ores into Germany will increase rapidly in the next few years, inasmuch as a number of the great companies above mentioned have only begun this year to develop their properties there. It is estimated that the production of the Briey basin will rise to 18,000,000 to 20,000,000 tons within four or five years. Experts estimate the quantity of ore in it at 2,500,000,000 tons. The German interest in the district has greatly increased since the government railroads made a heavy reduction in the freight rates on ores from there early in 1910.

International Congress on Chemistry in 1912

Committee appointments for the eighth International Congress of Applied Chemistry to be held in New York City and Washington, D. C., in September, 1912, have been practically completed and pamphlets giving the constitution and by-laws, general rules, committees and official representatives may without doubt be obtained from Dr. Bernhard G. Hesse, secretary of the congress, 25 Broad street, New York. The opening meeting is to be held in Washington, September 4, but the other meetings, both business and scientific, will be held in New York September 6 to 13, inclusive.

One of the sections has to do with metallurgy and mining and its work is in the hands of an executive committee assisted by a corresponding sectional committee. The personnel of these committees is in part as follows:

President, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.
Vice-President, J. B. F. Herreshoff, Nichols Copper Company, General Chemical Company, 25 Broad street, New York City.
Secretary, Walter S. Landis, Lehigh University, South Bethlehem, Pa.
Arthur L. Walker, Columbia University, New York City.
James Douglas, Phelps, Dodge & Co., and El Paso & Southwestern Railroad Company, 99 John street, New York City.

Sectional Committee.

Lawrence Addicks, United States Metals Refining Company, Chrome, N. J.
Alfred H. Cowles, Sewaren, N. J.
James Gayley, 71 Broadway, New York City.
John Hays Hammond, 71 Broadway, New York City.
P. Heroult, 149 Broadway, New York City.
Henry M. Howe, Columbia University, New York City.
H. H. Laughlin, Jones & Laughlin Steel Company, Pittsburgh, Pa.
J. A. Mathews, Halcomb Steel Company, Syracuse, N. Y.
Richard Moldenke, American Foundrymen's Association, Watchung, N. J.

Another section is to be given over to fuels and asphalt, and the sectional committee, with the officers of the executive committee, includes the following:

President, David T. Day, United States Geological Survey, Washington, D. C.
Vice-President, F. Schniewind, United Coke & Gas Company, 17 Battery place, New York City.
Secretary, Edward W. Parker, United States Geological Survey, Washington, D. C.
Irving C. Allen, United States Bureau of Mines, Pittsburgh, Pa.
L. P. Breckinridge, Yale University, New Haven, Conn.
Chas. A. Davis, United States Bureau of Mines, Washington, D. C.
R. H. Fernald, Case School of Applied Science, Cleveland, Ohio.
J. C. W. Fraser, United States Bureau of Mines, Pittsburgh, Pa.
Clifford Richardson, 30 Church street, New York City.
F. M. Stanton, United States Bureau of Mines, Pittsburgh, Pa.

There is also a section on paints, drying oils and varnishes. The president of the executive committee of the section is Maximilian Toch, Toch Brothers, 320 Fifth avenue, New York City, and the vice-president is Gustave W. Thompson, National Lead Company, 129 York street, Brooklyn, N. Y.

The Lyons Boiler Works, De Pere, Wis., reports the following boiler orders recently received within five days: Four 400 hp. each, for the new Rand-McNally building in Chicago; three 200 hp. each, for the Woodmen of the World building in Omaha; one 300 hp. for the Wolf River Paper & Fiber Company, Shawano; one 250 hp. for the Spaulding Hotel, Duluth; one 150 hp. for the King County Hospital at Seattle, Wash.; one 145 hp. for the Walter Bros. Brewing Company, Menasha; two 200 hp. each, for the Chicago, Burlington & Quincy Railroad; one large boiler for the steamer Cotton Blossom, Mount Pleasant, W. Va.

Pittsburgh and Vicinity Industrial Notes

The Youngstown Sheet & Tube Company, Youngstown, Ohio, recently made a shipment of 10,000 ft. of 14-in. steel pipe to a customer, which was furnished in 40-ft. lengths with a sleeve coupling in the center and flange couplings on the end, thus materially facilitating the laying of the pipe in the field. The pipe was loaded on steel cars and was promptly delivered and in perfect condition, there being no shifting of any of the pipes nor damage to them whatsoever, despite their great length. The company is specially equipped to manufacture large sizes of pipe in both steel and iron, but it also makes small sizes. Of its 10 pipe mills, 4 make pipe, 8 in. and larger, the maximum size being 20 in. The company carries in stock a complete range of sizes of large pipe.

Contracts have been let for a modern hotel at Youngstown, Ohio. J. G. Butler, Jr., of the Brier Hill Iron & Coal Company, and chairman of the Bessemer Pig Iron Association, is a heavy stockholder in the new enterprise. The architects are Clinton & Russell, who built the Hotel Astor in New York City, while the contract for the building has been placed with Caldwell & Drake, Columbus, Ind., who recently finished building a court house in Youngstown, costing about $2,000,000. The new hotel is to be finished by October, 1912, and will cost about $1,000,000.

In connection with the open-hearth plant to be built by the Youngstown Sheet & Tube Company a jobbing mill will be built to roll plates from 3/16 in. to No. 14 gauge. For the open-hearth plant, which will consist of six 100-ton furnaces, the only contract placed so far is for the steel buildings which went to the American Bridge Company. Contracts for the open-hearth furnaces, blooming mill, engines and other equipment will likely be placed the coming week.

The United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, has received a contract from the Milton Mfg. Company, Milton, Pa., for a 500-ton high-speed steam-hydraulic forging press, which it expects to ship about December 1. The Milton company makes all kinds of nuts for heavy service and will use this press in making the larger sizes of nuts.

The Treadwell Construction Company, Midland, Pa., is operating its plant full time on orders for steel tanks, plate work for blast furnaces and steel plants, and also on the 11-ft. water-pipe line for the city of Los Angeles, Cal. On the last-named contract the company has made shipments of over 100 carloads, or about half the quantity.

The Falls Creek Board of Trade, Falls Creek, Pa., David C. Whitehill, corresponding secretary, has started on a campaign to induce manufacturing concerns to locate at that place. It is issuing literature showing the advantages of Falls Creek as a manufacturing center, special stress being laid on its railroad facilities and cheap fuel.

J. & J. B. Milholland, Pittsburgh, have received contracts for the erection of a complete coal-crushing plant, operated by an inclosed type high-speed engine, for the Washington Coal & Coke Company, Washington, Pa., and two gravity inclines for coal-mine operations to be installed for the St. Louis & Rocky Mountain Mining Company at Raton, New Mexico. The latter order is a duplicate of an order filled by the company last year.

The Penn Motor Car Company, which recently purchased a site of three acres in the New Castle, Pa., district, has awarded a contract to the Richardson Construction Company, Pittsburgh, for the erection of a new plant. The main building will be 60 x 510 ft., with six wings, each 60 x 150 ft. An office building, power plant and other buildings will also be erected. The contract calls for the completion of the main building by the middle of January, 1912.

H. E. Barney and C. W. Laughlin, formerly connected with the Pittsburgh office of Manning, Maxwell & Moore, have resigned and have organized the Laughlin-Barney Machinery Company with a capital of $50,000. Its offices will be Union Bank Building. The company has been appointed agents in the Pittsburgh district for the following concerns: Newton Machine Tool Works, Philadelphia, slab milling machines, slotters, rotary planers and special machinery; Kearney & Trecker Company, Milwaukee, Wis., plain and universal and vertical milling machines; Ajax Mfg. Company, Cleveland, Ohio, upsetting heading and forging machines for bolts and rivets and a general line of forging machines. The company is also agent for Reliance bolt cutters for cutting and threading bolts from 1 to 6 in. in diameter.

The Youngstown Furnace & Supply Company, operating a foundry at Niles, Ohio, has decided to discontinue the manufacture of stoves and ranges, and hereafter will devote its attention entirely to making heating furnaces and furnace supplies.

H. S. Wilkinson has been elected a director of the Crucible Steel Company of America, Pittsburgh, succeeding A. W. Mellon, resigned. Beginning with the coming year, the annual meeting of stockholders of this company will be held on the third Friday in November, instead of the third Friday in October.

The Mohawk Condensed Milk Company is building a plant at Weirton, W. Va., near the works of the Phillips Sheet & Tin Plate Company for the manufacture of cans for its different milk factories.

George T. Ladd, manufacturers' agent, Farmers' Bank Building, Pittsburgh, has received an order for a 12 and 16-in. pipe installation with the necessary valves for a hydraulic mining operation for the Guadalupe & Porce Mining Company, Colombia, South America. He also has the contract for supplying the automatic stop, check and relief valves to be used in the improvements to the Washington Tin Plate Company's plant, Washington, Pa.

The A. W. Wycoff Company, Farmers' Bank Building, Pittsburgh, has been appointed general sales agent in western Pennsylvania, eastern Ohio and northern West Virginia for the Kerr Turbine Company, Wellsville, N. Y., manufacturer of the Kerr steam turbine, turbine-driven generators, pumps, fans and blowers. The turbines are built in three types for high pressure, exhaust steam and mixed flow, and have been adopted by the United States Government.

At the annual meeting of stockholders of the Carbon Steel Company, of Pittsburgh, held last week, Charles McKnight was elected president to succeed Frank B. Robinson, and T. S. Atwater, vice-president to succeed E. G. Buchannon. The plant of this company is equipped with eight 50-ton open hearth steel furnaces and two trains of rolls, one 36-in. universal and one 128-in. plate mill, forging hammers, etc. The annual capacity is 125,000 tons of open hearth ingots and 85,000 tons of finished steel.

Frank G. Wallace was appointed receiver last week of the Pittsburgh Lamp, Brass & Glass Company with plant on the N. S., Pittsburgh. The company is capitalized at $1,500,000, equally divided between preferred and common stock. In the petition filed in the court by Alfred R. Hamilton of the company, it is stated that the company has increased its business at such great expense that it will not be able to meet its obligations, and that numerous suits are threatened.

The Steel Alloys Company, of Wheeling, W. Va., has purchased the plant and property of the West Virginia Bridge & Construction Company at Wheeling for $20,275.

The general offices of the Monongahela River Consolidated Coal & Coke Company, now merged with the Pittsburgh Coal Company, have been removed from Water street to the Oliver Bldg., Pittsburgh.

The plant of the Eureka Steel Company, West End, Pittsburgh, has been sold at receivers' sale to M. A. Ablersberg, Homestead, Pa. The plant was recently built for the manufacture of tool steel, and it is understood that the new owner will operate it.

The growth of the Carnegie Technical Schools in Pittsburgh has been so great that another building, to cost $100,000 or more, will be erected in addition to the structures already planned. It will be for the exclusive use of the civil engineering department of the School of Applied Science and will contain two large testing laboratories to be equipped with heavier machinery than is found in any similar institution in the world.

The Petroleum Iron Works Company, Sharon, Pa., recently closed a contract for the building of a penstock at Jonqueire, Canada, to be 12 ft. in diameter, a mile long, from ½ to 15/16 in. thick, and which will weigh approximately 3000 tons. It is now being fabricated at the shops. C. H. Todd, president, and C. P. Wagner, engineer of the company, are in Canada, with a view of locating a temporary plant for the handling of the construction in the field.

Foundry of Tractor Works at La Porte

Arrangement and Equipment of Machinery of the M. Rumely Company, Producing Oil-Pull Traction Engines

The narrative of the M. Rumely Company, La Porte, Ind., as manufacturer of hullers, separators and steam tractors, begins in the earliest chapters of the development of harvesting and soil cultivation by power machinery. Within the past two years this company has reaffirmed its position as a pioneer in this field by placing on the market an oil burning internal combustion traction engine. For the exclusive manufacture of this type of tractor, a plant apart from the existing works of the company has been built—and is now being increased—with capacity sufficient to produce 3600 Oil-Pull tractors annually. The description of another tractor works, published in *The Iron Age* of June 29, together with this article, presents indications pointing significantly to the great need of displacing men and horses with mechanical power, if the cultivation of the tremendous farming areas of the United States Northwest and Western Canada is to proceed unhampered. This necessity has arisen out of the scarcity of labor and the impossible expense of maintaining throughout the year a sufficient organization, whose capacity can then be made useful only during a very short season.

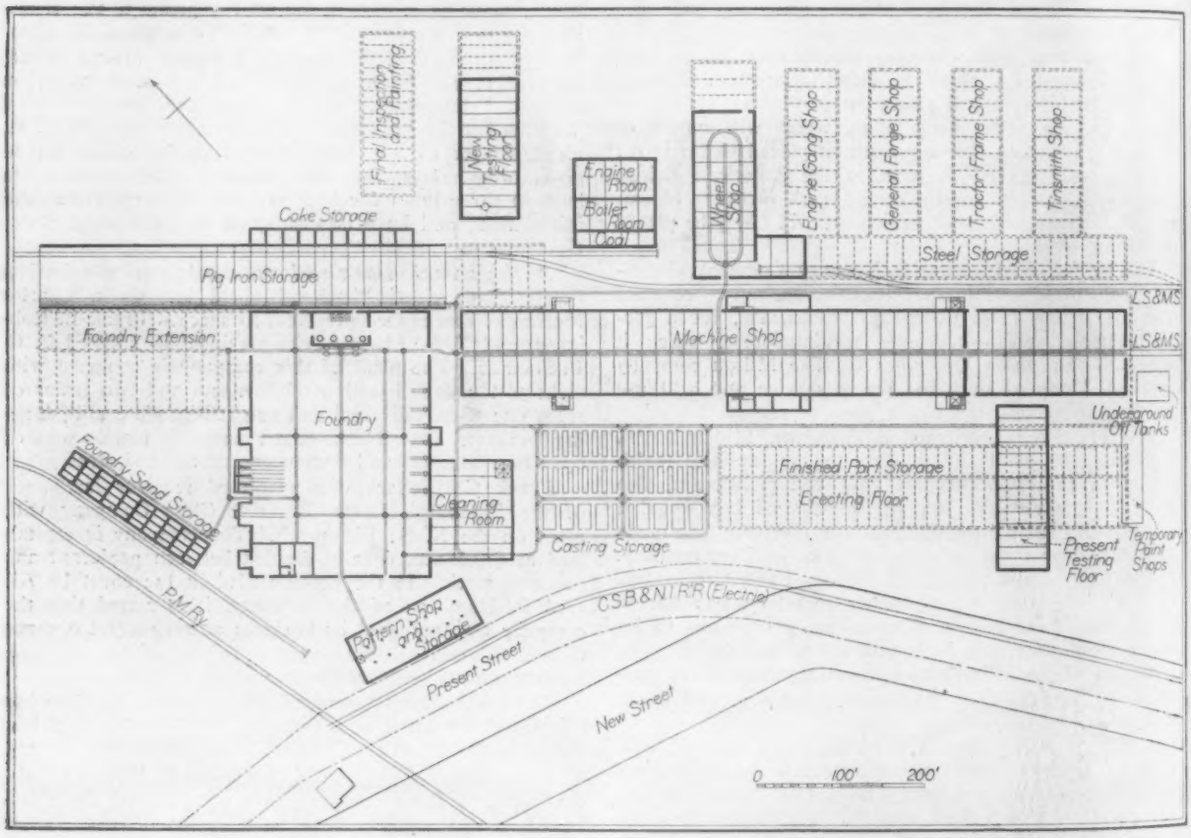


Fig. 1.—General Ground Plan of the Complete M. Rumely Tractor Plant at La Porte, Ind.

Oil Fuel for Traction Machinery

Three sources of power for traction machinery have been employed—steam, gasoline and kerosene. The steam engine has been forced to contend against the excessive cost of coal and frequent inaccessibility of water in the west. The gasoline engine has had its greatest development only in the past few years and its use for traction power has been correspondingly recent. The oil engine in the past has been far from successful, particularly as regards proper combustion and regulation. At the same time, from the standpoint of fuel cost, the oil engine has enjoyed a conspicuous advantage, increasing proportionately as the demand for gasoline has increased, until at the present time kerosene is obtainable at the lowest price recorded. To a great extent this condition has been the incentive in the investigations from which a means has been developed for securing the proper combustion and regulation of a kerosene mixture capable of being utilized in the successful operation of an internal combustion engine. By acquiring the Secor-Higgins patents the M. Rumely Company has, it is believed, obtained such a means and to this fact is due entirely the extensive plant, a ground plan of which is shown in Fig. 1.

The carburettor that embodies mechanically the Secor-Higgins principles is employed not only in the operation of the Oil-Pull tractors already in service, but also in the line of stationary oil engines being manufactured in Milwaukee under these patents and in the adoption of the same device by a well known manufacturer of pneumatic tools which company is to use an oil engine as the motive power for isolated lighthouse compressor units. A perspective cross-section of the carburettor is shown in Fig. 2. Its principle has been developed from the hypothesis that air forced into a vacuum of any definite degree, through apertures having a fixed area ratio, will always flow at the same rate and in the same quantity, and in contact with kerosene and water, will draw in and atomize a constant proportion of each under constant conditions. It follows that if a port area ratio in the carburettor can once be established to give the correct mixture for proper combustion under any one load, increasing or decreasing the port areas in that fixed ratio will always yield a proper mixture for any load. The presence of water vapor in the carburettor mixture contributes to a regulation of the temperature and also to the scavenging of the cylinder when the explosion dissociates the vapor into nascent

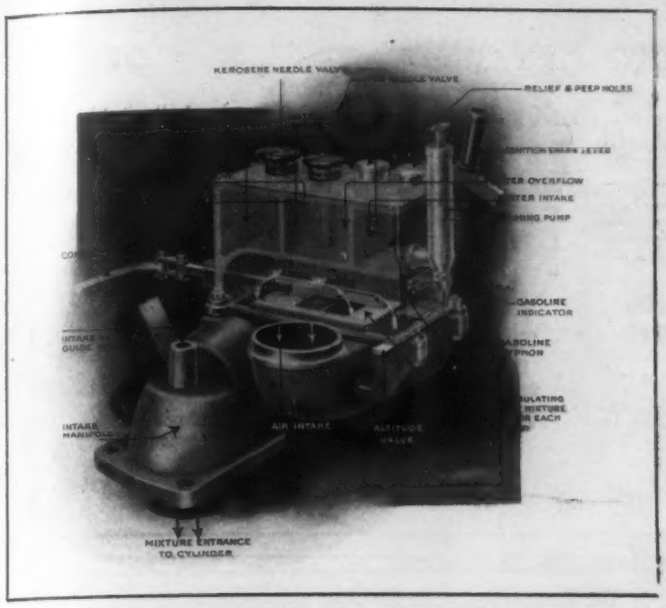


Fig. 2.—Details of Secor-Higgins Carburettor.

hydrogen and oxygen. A detailed description of the valve arrangement by which the constant condition under which the correct mixture is obtainable and of the governor connection through which the load fluctuations are transmitted to the carburettor will not be taken up at this time.

The departments and buildings included in the complete tractor plant and their relative location in the layout, are indicated in the ground plan, Fig. 1. This entire plant scheme is to be completed by the end of 1912. This account will embrace only that portion now in operation, including chiefly the foundry, machine and erecting shop, wheel shop, testing floor power plant, and the accessories of each. The present article will be given up to the foundry, leaving the remaining subjects for a subsequent article. Construction of these buildings was begun in June, 1910, and completed in December of the same year.

General Design of the Foundry

The foundry is a steel frame building 320 ft. long and 220 ft. wide with Federal tile roofing, concrete walls above the window ledges and brick below. Fig. 3 is a cross-section showing the design of the structural work which is arranged with a main central bay 60 ft. wide with 34 ft. of clearance under the truss, and an 80-ft. gable roof span on each side, 14 ft. from floor to truss chord. These side bay trusses are supported in the middle by columns dividing the span into two 40-ft. bays or a total of five bays in the entire width of the building. The building is located on filled ground and the concrete footings under the building columns are carried on driven piles. The columns are placed at 20-ft. centers.

The foundry layout is illustrated very completely in Fig. 4. The storage yard lies at right angles to the direction of the foundry and immediately adjoining the cupola or east end of the foundry building. The yard is contained within a crane runway 73 ft. wide and 500 ft. long. At the far side from the building a switch connecting two trunk lines traverses the storage space and on this material is brought in. The unloading and distributing operations are handled by a 5-ton Pawling & Harnischfeger crane equipped with a 46-in. 5-ton Electric Controller & Mfg. Company magnet. The runway for a length of 300 ft. adjacent to the cupola charging elevators is roofed over as illustrated in Fig. 5 to afford protection where most of the handling is necessary.

For sorting up and weighing the cupola charges, an electrically driven Fairbanks scale car operates along a depressed scale track located as shown in Fig. 4. This depression allows running the pig iron trucks and charging tray trucks directly on the scale car from the industrial trackage system of the foundry and more particularly in this connection, from the charging elevator platforms. To relieve congestion on the cupola charging floor a stretch of industrial track paralleling the scale track is laid for the storage of charging trucks. This track is also used for carrying off the cupola cinder in Hunt type ash buggies.

Fig. 4.—View of Storage Yard Showing Crane and Type of Roof.

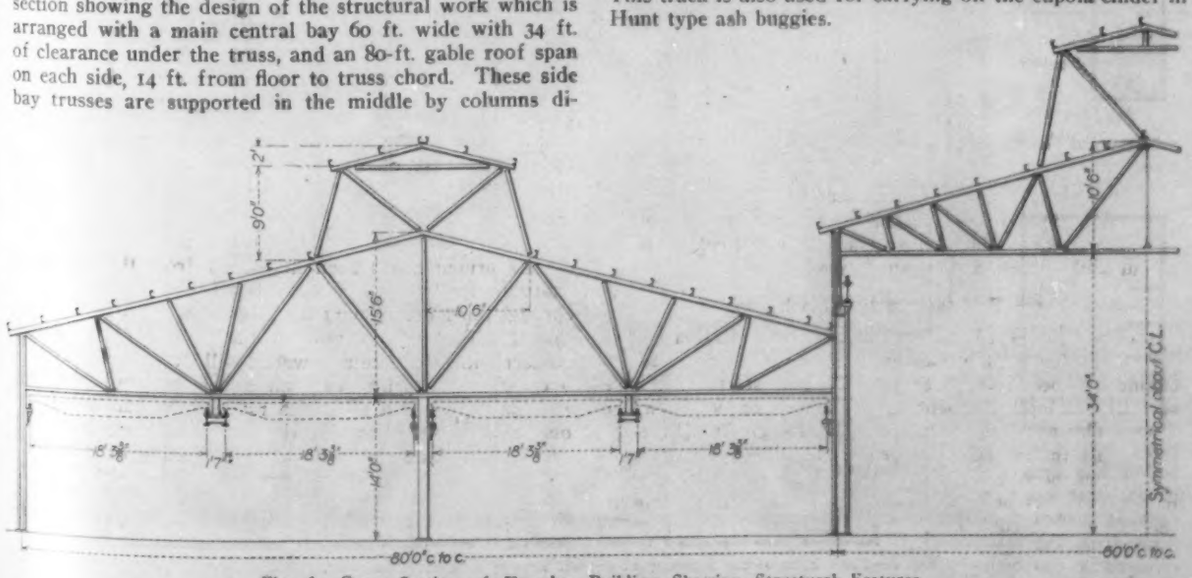


Fig. 3.—Cross Section of Foundry Building Showing Structural Features.

Cupola Department and Hot Metal Handling

The cupola room is enclosed in brick partitions, occupying 40 x 60 ft. at the east end of the central bay of the foundry. It is arranged with a mezzanine and charging floor, plans of which are included in Fig. 4. A view of the cupola room from the molding floor is shown in Fig. 6 and of the charging floor in Fig. 7. Provision has been made for four cupolas of which two are installed. They are 48 in. diameter, one built by the Whiting Foundry Equipment Company, and one by the Calumet Engineering Works, both of Harvey, Ill. One cupola is used for semi-steel mixtures and the other for gray iron. The cupola capacity is designed for an approximate output of 100 tons

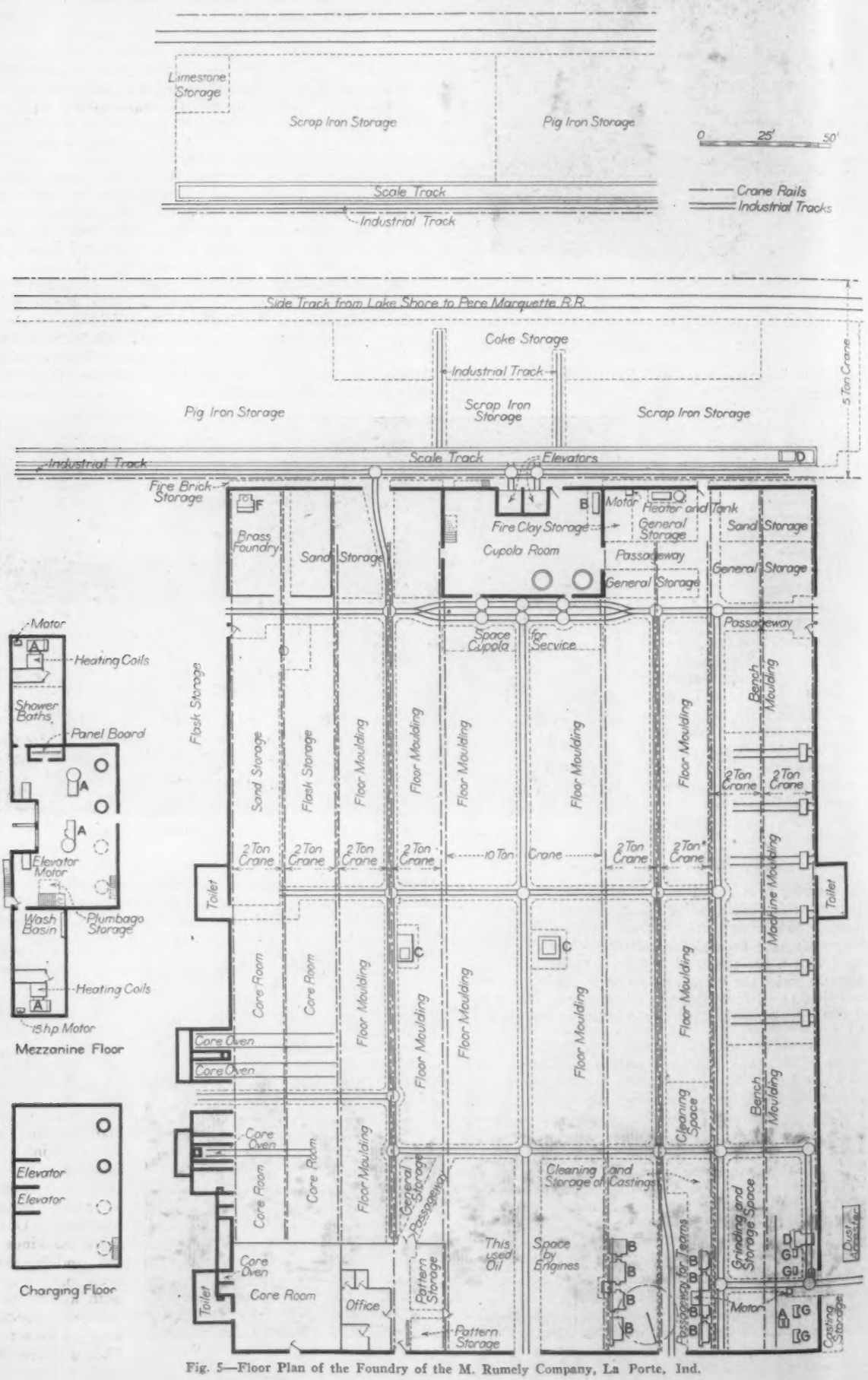


Fig. 5—Floor Plan of the Foundry of the M. Rumely Company, La Porte, Ind.

Fig. 6.—Cupola Room from Central Molding Floor.

daily. The cupolas have been operated on a fuel consumption ratio of 9 to 1. The mezzanine floor is at a height of 12 ft. above the main floor and 9 ft. 10 in. below the charging floor. On it are located the pressure blowers, comprising one Connersville unit, capacity 24 cu. ft. per revolution, and a No. 10 B. F. Sturtevant type, both direct motor driven by 30 hp. units. Each blower delivers to either cupola. Large wash rooms equipped with lockers and shower baths open off this floor. The ventilating fans for the foundry which are also arranged with heating coils to provide an auxiliary indirect heating system during the winter season, are located as shown in the floor plan. They are driven by 15-hp. motors. The charging floor is built substantially, being made of 6-in. channels, laid flange to flange on I-beam girders. The charging elevators are Otis electrically operated having 8 x 8 ft. platforms and a capacity of 5 tons each.

The castings to be made in this foundry range from very small parts in large numbers to heavy pieces like crank cases, gears and pulleys weighing close to a ton each. The equipment both as regards conveying and molding was designed and arranged with relation to the foundry floor to accommodate this wide range in weight and to reduce to a minimum, manual handling and molding. A study of Fig. 4 will make apparent the manner in which this has been worked out. The molding floor embraces about 36,000 sq. ft. which, with continuous melting, presumes an output of 2 tons of finished castings per day for each 700 sq. ft. of floor space.

Reference to Figs. 4 and 6 indicates the manner of handling and distributing the hot metal. The cupola spouts project over the curtain wall in front of the cupola room and pour the metal in 1-ton ladle trucks spotted on two parallel industrial tracks immediately in front of the cupolas. From this storage and distributing point the industrial trackage traverses each aisle or bay, so that the original ladle is brought to within a few feet of the work at any point. Here the metal is transferred by means of crane hoists into 700-lb. ladles from which the mold is poured. Each molder pours his own work.

The crane service comprises eight runways, parallel to each other in the direction of the foundry axis. In the center bay the 60-ft. space is served by one 5-ton and one 10-ton Pawling & Harnischfeger crane with a 3-ton auxiliary hoist. In addition, from a number of columns in the central bay, a jib crane is hung carrying a 2-ton Peerless hoist.

The 80-ft. width of the north bay is spanned by four 2-ton Whiting electric cranes equipped with Sprague hoists, floor operated. In the south bay with the exception of the 20 ft. along the wall used for bench and squeezer machine molding, the floor is served by three similar 2-ton cranes

Fig. 7.—Cupola Charging Floor.

operating from end to end of the building. These combined floor and overhead facilities render every portion of the molding floor accessible for mechanical conveying.

The Use of Molding Machines

The classification of work is illustrated in the floor plan. In the main bay, the floor molds in the heavier work are put up. A general view of this floor is presented in Fig. 8. The heaviest work such as the crank cases weighing 1800 lb. and fly-wheels for which the rectangular and circular metal flasks shown in the illustration are used, are made on Norcross 24-in. cylinder jarring machines. The master gears were formerly molded by hand, but recently two 60-in. diameter, 8-in. draw heavy doubleshaft Pridmore stripping plate machines have been installed for that purpose. The castings of medium weight are also made up on Pridmore stripping plate machines of which there are two 28-in. diameter, three 28 x 28 x 8-in. draw, three 28 x 28 x 10-in. draw, and two 14 x 14-in. standard machines. One of these machines and the molds made thereon, together with a view of the pouring operation, are shown in Fig. 9. The cast-

Fig. 8.—Heavy Molding Floor in the Central Bay.

Fig. 9.—Stripping Plate Machine Work.

iron flasks are designed for 15-in. pulley molds and have taper self-aligning lugs. The usual output of a machine is about 55 molds a day. This work is done under the smaller cranes in the south bay adjacent to the heavy work floor.

The installation of the jarring machines has afforded the company an interesting comparison with the hand molding of the heavier pieces. Three molders and two helpers, ramming both cope and drag of a crank case mold upon the jarring machine, will complete a mold in approximately two hours as compared with a full day's work by hand with two molders and one helper. This is a saving of between $6 and $7 per mold in labor alone. On flywheels a corresponding saving of about $3.50 per mold is made where five are put up on a machine each day.

In the 40-ft. bay along the south side of the foundry the machinery equipment for making up the small molds in snap flasks is located. A view of this bay is shown in Fig. 10. This equipment consists of twelve Tabor Mfg. Company squeezer machines. The machines are mounted on wheels and are placed on wide gauge tracks running across the bay to the wall. Sand for the molds is piled parallel to the tracks. Work is begun with the machine at the inner end of the track. As the making of molds progresses the machine is pushed out toward the wall, the finished molds replacing the sand as it is used up. The arrangement has been found to increase the capacity of the machines, and molds of the character illustrated in Fig. 10 are made at the rate of sixteen per hour. Fig. 11 is a view of one of these machines in greater detail. Some of the irregular smaller snap flask work is put up by hand on tables mounted in the same manner as the Tabor machines.

Fig. 11.—One of the Squeezer Molding Machines with Operator.

Accessory Departments

A part of the core room is shown in Fig. 12. This work occupies the west end of the north bay for a length of about 220 ft. of which 40 ft. is partitioned off. In this room small cores are made by girls, the room being provided with shelf core ovens and all necessary materials so that it is essentially self-contained. Four track ovens 7 x 15 ft. and two shelf ovens for baking cores are built in the wall of the main core room. They are fired from pits outside. This department also enjoys the same crane and track service as the molding floor.

The cleaning room for castings, in the completed plant layout, provided for at the southwest corner of the foundry building where the finished castings may be delivered directly into the castings storage yard, is not yet built. For the present the west end of the south bay of the foundry is used for this purpose. It is equipped with eight tumblers and cinder mills built by the Central Iron Works, of Quincy, Ill. Fig. 13 shows one of the two groups of four tumblers. Each group is driven from a shaft belted direct to a motor. A portion of the dust piping is shown in this illustration. From the tumblers and the four-motor driven grinders shown in the plan, Fig. 4, the dust is drawn by an overhead fan and discharged into a dust collector outside of the building and illustrated in Fig. 14. This collector has hopper bottoms with foot valves for the removal of the accumulated dust. The crane service available for handling the castings in this department is also indicated in Fig. 13. Air hammers are used for shipping.

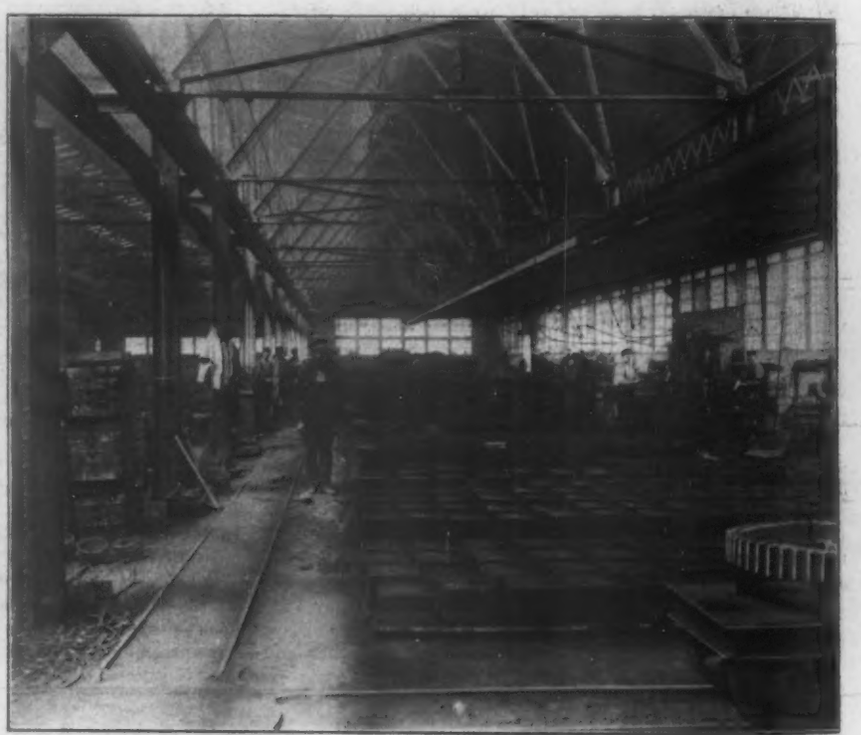


Fig. 10.—South Bay of Foundry Showing Row of Squeezer Molding Machines.

The location of storage space for flasks, patterns, clay sand and other materials within the foundry are indicated in the plan drawing. The sand storage includes a sand mixing floor equipped with two vertical axis rotating type electrically driven mixers. The floor is spanned by a hand operated I-beam crane carrying a 2-ton Peerless hoist. The sand is all mixed at this point, loaded into a ½-yd. bucket and carried wherever required. The molders handle the sand very little and do not shake out their own flasks or cut-over the sand. Sand bins of poured concrete have been completed recently. They parallel a railroad switch and the sand is shoveled from the car into

an elevator delivering to an overhead transfer hopper which distributes the sand to the proper bin. A re-inforced concrete pattern storage building of fireproof construction has also been completed recently. In addition to providing safety for the patterns, space is provided for a wood working shop and for a shop draughting office. The industrial track system connects the pattern storage with the foundry.

At the northeast corner of the foundry building space has been allotted for a small brass foundry with a two-pot floor pit furnace. Part of the brass molding is bench work and part is snap flask work for which a Tabor squeezer is provided. The equipment includes a grinder, band saw and a brass reclaimer..

The foundry is heated for the most part by direct radiation from overhead steam coils augmented by a hot-air indirect system which is used interchangeably as a ventilating plant. For artificial lighting, regenerative flaming arcs are used. They are suspended from about the level of the bottom truss chords and between every second truss.

Fig. 13.—One Row of Tumbling Barrels.

Suit Over a Southern Iron Company Promotion

The New York Court of Appeals gave a decision on October 20 in the case of August Heckscher, New York, against William Edenborn, formerly of the American Steel & Wire Company, a director of the United States Steel Corporation and now president of the Louisiana Railway & Navigation Company. Mr. Heckscher was awarded $237,000 damages, representing the original cash subscription of himself and associates to the syndicate which organized the Sheffield Coal & Iron Company, Sheffield, Ala. The syndicate which Mr. Edenborn organized purchased the properties of the United States Iron Company in Alabama and elsewhere. Mr. Edenborn's name was on the subscription agreement for $500,000 which, it appeared later, it was his intention to pay in the stock of the United States Iron Company, of which he owned 50 per cent. The stock of this latter company was later put into the Sheffield Coal & Iron Company at $700,000, of which $350,000 represented Mr. Edenborn's subscription. Mr. Heckscher and his associates contended that they believed the subscription was to be paid in cash and that they did not know of Mr. Edenborn's interest in the United States Iron Company. A number of the stockholders, including several officers of the American Steel & Wire Company, assigned their claims to Mr. Heckscher who tendered back the stock which had been accepted by the syndicate members and demanded repayment in full of the subscription money from William Edenborn. In the decision of the Court of Appeals Justice Hiscock said: "The defendant did not occupy the position of an ordinary vendor, but he was inviting others to confer upon him a fiduciary relationship. If he knew and they were ignorant of some fact which touched the very substance of that relationship and legally destroyed his ability to meet its full requirements, it was his duty to advise them of it, and for his failure so to do they were entitled to repudiate the agreement and avoid what has been done under it.

Fig. 12.—Foundry Core Room Showing Core Racks.

The International Exhibition of Sofia, Bulgaria, will be opened June 1 and closed August 31, 1912. The exhibition will be held under the presidency of the Royal Minister of Commerce and Agriculture, and will embrace all products of industry, commerce, agriculture, arts, instruction, hygiene, alimentation and sports. It has obtained the protection of the municipality and of the Chamber of Commerce and Industry of Sofia. The office of the organization committee is at 5 Alexander place, Sofia.

Fig. 14.—Elevated Dust Collector Outside of Foundry.

A Mechanically Operated Foundry

Equipment for Continuous Pouring and Sand and Mold Conveying

In the old sense the term foundry is a misnomer if applied to the brand new installation at the metal-wheel works of French & Hecht, Davenport, Iowa, it is rather a forced concrete structure with nearly all glass sides and a modified monitor roof, the foundry proper being on the second floor, while the spaces for the storage of sand and coke and the tumbling barrels, grinders, etc., are located beneath. The molding and casting of small work weighing not over 75 lb. are done on the continuous plan, the mechanical equipment being arranged in completely circular form. Circular conveyors distribute sand to the down-spouts; a circular traveling platform or table shown

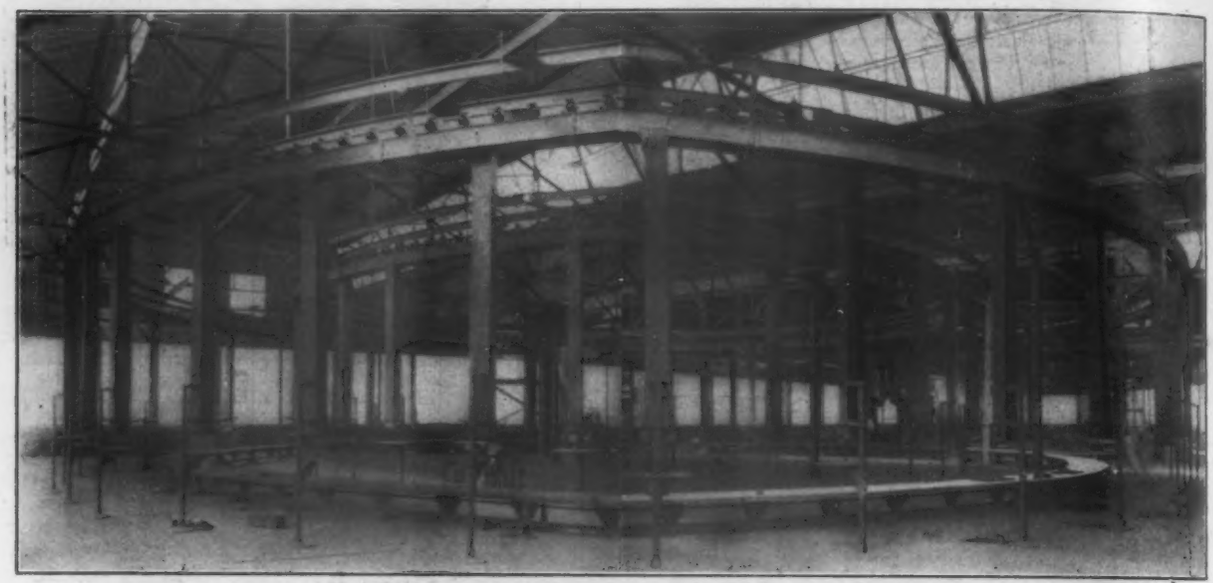


Fig. 1.—General View of the Circular Equipment Showing the Sand Elevators and Conveyors, the Down Spouts, the Molders' Stations, the Mold Conveyor Table and the Cupolas Installed in the New Foundry of French & Hecht, Davenport, Iowa.

castings factory. The entire plan and details of arrangement and equipment were conceived and worked out in the mechanical department of French & Hecht. Much of the construction work was done in the company's own shops. Equipment purchased outside, whenever not entirely standard, was made to harmonize with the one comprehensive plan which was so carefully worked out. A number of modern foundries were visited, the suggestions of foundry experts were sought, the particular needs of the special work to be done in the plant carefully considered and the present plant was the result. Fig. 1 is a general view of the circular equipment installed by the Webster Mfg. Company, Tiffin, Ohio, while Fig. 2 is a plan showing the drive employed. Figs. 3 4 and 5 are views in the foundry showing a portion of the charging floor, the twin cupolas and the ladle trolley track and the castings chute and elevators and mixing machines for the molding sand.

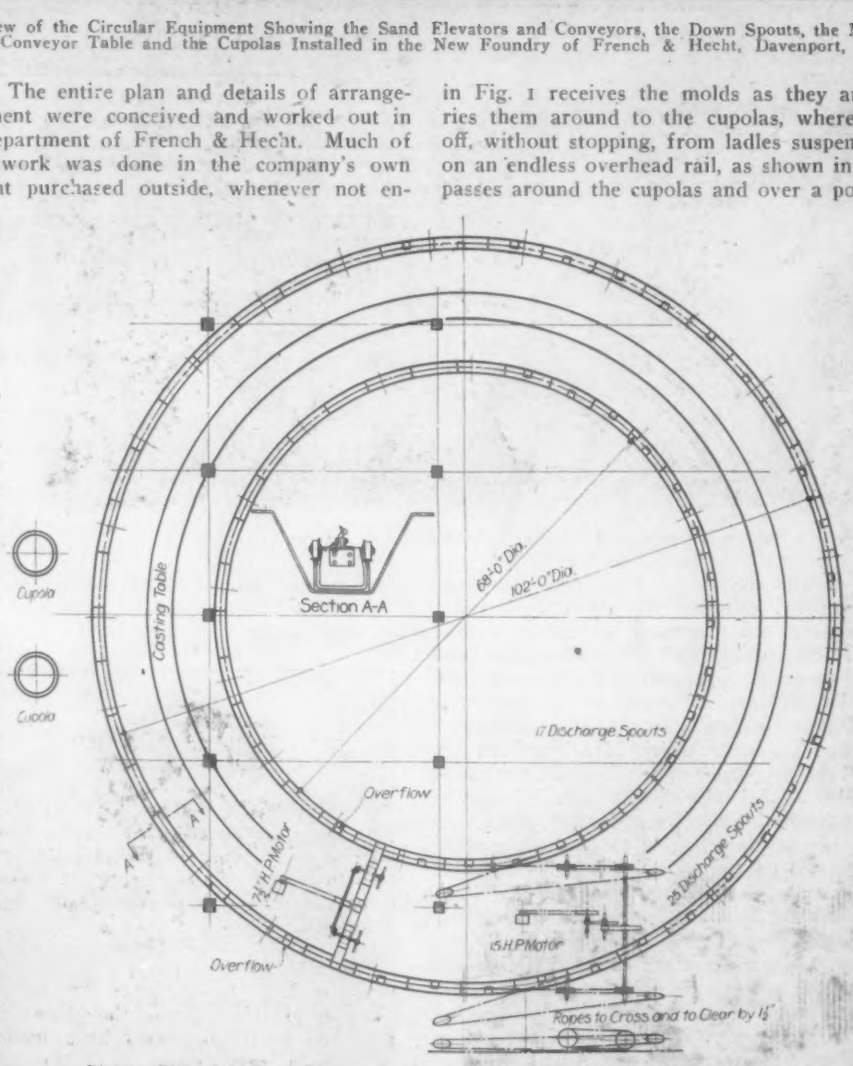


Fig. 2.—Plan of the Sand Conveyors, Showing Drive, Casting Table, Cupolas, etc.

The building housing the foundry is a two-story reinforced concrete structure with nearly all glass sides and a modified monitor roof, the foundry proper being on the second floor, while the spaces for the storage of sand and coke and the tumbling barrels, grinders, etc., are located beneath. The molding and casting of small work weighing not over 75 lb. are done on the continuous plan, the mechanical equipment being arranged in completely circular form. Circular conveyors distribute sand to the down-spouts; a circular traveling platform or table shown in Fig. 1 receives the molds as they are made and carries them around to the cupolas, where they are poured off, without stopping, from ladles suspended from trolleys on an endless overhead rail, as shown in Fig. 4. This rail passes around the cupolas and over a portion of the mold conveying tables.

Passing a few feet farther the molds are broken out into a hopper in the floor from which the sand is spouted to the mixing machine below, while the castings are carried away in a chute to the cleaning floor. A view of the mixing machine and the castings chute is given in Fig. 5. A general panoramic view of the molding floor, showing the overhead sand conveyors, the spouts to the molding stands and the circular mold conveyor platform, is given in Fig. 1, while Fig. 2 gives a plan of the circles, indicating the method by which the sand conveyors are driven.

The charging floor, a portion of which is illustrated in Fig. 3, is of ample area, thus giving room for storing lining brick, iron, coke, etc. The charges are made up on the lower floor of the building in charging trucks,

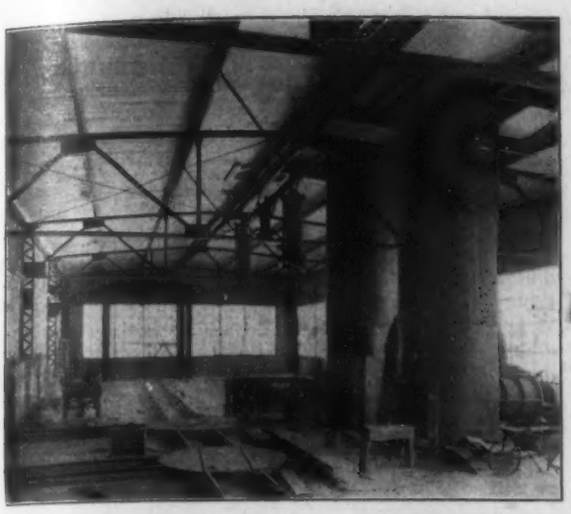


Fig. 3.—View Showing a Portion of the Charging Floor.

which are then lifted by the elevators, pushed along on tracks to either cupola, where air hoists which are clearly shown in front of the cupolas do the tilting and dump the charges. The blower supplying the blast is located behind and between the cupolas, gates in the tuyere pipes on the foundry floor below regulating the amount of air used.

Sand Mixing and Conveying

The sand screening and mixing machine shown in Fig. 5 is located on the ground floor, and the sand which is shaken out from the molds above is fed into it by the hopper. New sand is added as required and the mixture is delivered from the machine to the boots of the twin steel-encased elevators which extend upward 42 ft. to the floor above to feed the inner and outer circular sand conveyors. Gates are provided in the boot spouts, which are operated from the molding floor so as to regulate the delivery of sand to the elevators.

An electric motor belted to a countershaft drives the elevator, the power being transmitted through miter gearing at each end of the countershaft to the head gearing. The elevators discharge the sand into conveyors which, as can be seen from the section at AA, Fig. 2, are of the simple drag type with steel-plate flights and a trough of cast iron. This trough is 14 in. wide and 8 in. deep inside, and is made in 6-ft. sections. The flights are spaced 16 in. apart and each one is rigidly secured to the ¾ x 3-in. bar of steel, which, in sections end to end, forms the continuous circular member of the moving parts. There is a cross bar with a flanged wheel at each end running on rails formed by angle irons along the upper edges of the trough on each side which supports and carries the moving parts. At this point there is also an outward-facing V-grooved jaw, or cable grip. The circle of these jaws, spaced at intervals of 16 in. all the way around the conveyor, forms a sheave receiving a wire rope by which the conveyor is operated. The arrangement of these wire rope drives, which derive their power from an electric motor, is shown in Fig. 3. The outer conveyor has a diameter of 102 ft., measured to the center of the trough, and the inner one has a diameter of 68 ft.

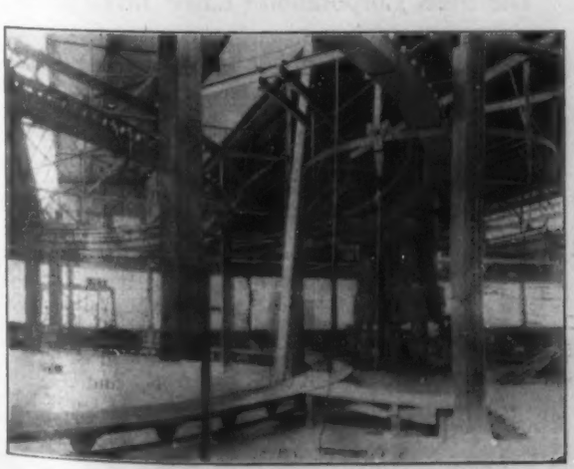


Fig. 4.—The Cupolas and the Trolley Track for Ladles.

Along that portion of the circle devoted to molding are located 42 down-spouts to the molders' stations, 25 from the outer conveyor and 17 from the inner. Each of these spouts is 9 in. square, inside measurement, and has a double undercut discharge gate controlled by a hand lever at the bottom. The supply of sand is kept slightly in excess of the maximum demands of the molders so that a little is always carried past the last discharge spouts and around to the tail discharge spouts near the elevators. By watching the tailings from these spouts the attendant regulates not only the total supply of sand but also its division between the two conveyors.

The Circular Mold Conveyor

Nearly if not quite all the previous forms of mechanical mold carriers have been of jointed construction with many moving parts. A departure from this practice has been made by French & Hecht in constructing a circular cast-iron table bolted into a practically rigid unit with no working joints whatever. This rigid circle operates on a single track laid on the floor with one file of supporting wheels as shown in Fig. 1. A motor-driven lineshaft crosses this circle under the floor and is controlled by an attendant at the center of the circle. At each end of the lineshaft there is a worm-gear connection to the chain drive for the mold conveyor which is thus driven at two diametrically opposite points. From his position in the center it is possible for the attendant to regulate the speed of the conveyor according to the work of the men pouring off the molds as they pass the cupolas. The molders' stations being located both outside and inside the mold conveyor, it is possible to utilize every running foot of the table.

Fig. 5.—The Castings Chute and Elevators and Mixing Machine for the Sand.

This circular equipment for small work occupies only about half of the second floor. The remainder of the floor space which is located on the other side of the cupolas and is served by them is given over to heavy work, principally machine molding. A large core room with sand-elevating machinery, also furnished by the Webster Mfg. Company, is located on this floor as well. The two-story arrangement of the foundry as a whole permits of the quick removal of sand and castings from the molding floor to the mixing machinery and the tumbling barrels on the floor below, both descending directly by gravity.

Graphite is so many things that it isn't that careless dispatching of references to the subject by the mere use of the word itself can hardly be condoned. A paper by W. C. Arsem, read before the recent convention of the American Electro-Chemical Society at Toronto, referred at length to the conflict of authorities on the subject, and explained in detail some experiments he had made which led to the conclusion that graphite is an allotropic form of carbon, having a specific gravity of 2.25 to 2.26.

...SONS.
...Mechanical and Civil Engineers,
PITTSBURGH, PA.

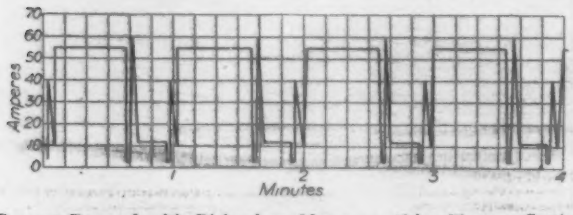
Motor Driving for Planers*

Current Variations with Direct Connected Reversing Motor

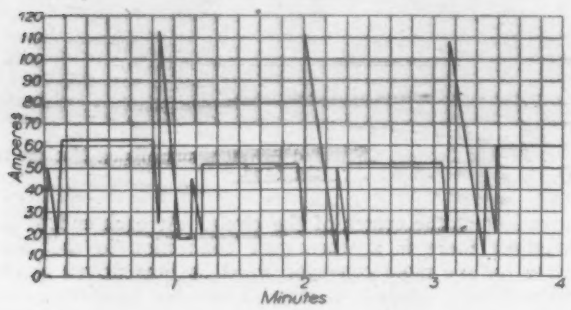
BY GEORGE W. RICHARDSON

A motor to drive a planer reversing with every stroke from the shortest to the full stroke of the planer table must be a very slow speed motor, controlled by automatic controller and requiring dynamic braking to stop the table so that there will not be any counter-electromotive force at the time the applied electromotive force is applied to the armature of the motor at the moment of reversals. This must be so arranged that the dynamic braking relay is off at the moment the applied electromotive force is connected and that the dynamic braking take effect at the moment the applied electromotive force is opened. This is really the success of the direct connected reversing motor drive to-day on planers.

In our machine shop we have a 120-in. planer which was driven by a 45-hp. compound wound constant speed motor driving through a countershaft to the belt shaft containing the flywheel and belt pulleys. These belts were vertical and 6 in. wide and four-ply. They reversed from one pulley to the other in the usual way. At the moment of these reversals the motor would be extremely



Current Demand with Richardson Motor on 42-in. Planer. Cutting speed, 17 ft. per min.; return speed, 44 ft. per min.; two round nose tools, ½-in. cut, 3/32-in. feed, cutting cast steel.



Current Demand with 50-hp. Reversing Motor on 8-ft. Planer. Cutting speed, 12.5 ft. per min.; return speed, 42.8 ft. per min.; one tool, 5/16-in. cut, ⅛-in. feed, cutting annealed nickel chrome steel.

overloaded. These high peaks of current continually coming on the motor at every reversal caused trouble and we were always doing some repairs. Over 2 gal. of oil were used per day on the planer. The actual delays to the work due to the conditions probably amounted to at least 25 to 30 per cent. of the time of cutting material.

I was asked to try one of my double armature motors to see if we could overcome the difficulties we were having with the old drive. I installed one 50-hp., 220-volt, compound wound double armature motor on the 120-in. planer on December 1, 1909, using an automatic controller from one of our mill tables, with the exception that I added some new features, such as dynamic braking, field weakening relays and no-voltage and overload relays. This outfit has not given us any trouble whatever, except the first few days in getting the controller adjusted. For a period of 19 months the apparatus has not cost over $8. The apparatus uses approximately one pint of oil per day. The planer does not chatter. The full speed of the double armature motor while cutting is 224 r.p.m., and the center shaft speed is 128 r.p.m. The peak load is 100 amp., approximately 30 hp., starting torque. The dynamic braking current is approximately 150 amp. The periphery speed of the armatures while cutting is 896 ft. per min., and 1792 ft. per min. on the return stroke of the table. This makes the motor easy to reverse, due to the low centrifugal force of the armatures. The cutting speed is from 20 to 25 ft. per min., and the return speed is from 20 to 50 ft. per min.

A reversing motor drive that has been placed on Pond planers is no doubt a good apparatus for this kind of work. They use a single armature special-made interpole motor, wound 1 to 4 speed, that is 250 to 1000 r.p.m., using dynamic braking for stopping the motor before reversing. The periphery speed of the armature of a 50-hp. motor for a 96-in. planer is approximately 1177 ft. per min. to 4710 ft. per min. The cutting peak load is 50 amp., while the reversing peak load is 112 amp. The cutting speed 12 to 25 ft. per min. and the reversing speed 12 to 48 ft. per min.

The lower curve in the accompanying cut shows the ampere load on the 50-hp. Niles-Bement-Pond Company's reversing motor drive on a 96-in. planer, cutting speed 12½ ft. per min., return speed 42 ft. per min., one tool cutting 5/8-in. with ⅛-in. feed, cutting annealed nickel-chrome steel. This curve shows the peak load to start motor was 50 amp., then, as the speed increased, the time of start to the time of cut was 5 sec. and the current dropped to 20 amp. Then, as the tool cut into the material the current went up to 62 amp. for 43 sec., then the current was off for 2½ sec. Then, reversing to high speed, the current rose to 112 amp. and the speed kept getting faster until the current was down to 18 amp., taking about 10 sec. time, then the line continued straight for 5 sec., which was the full return stroke Then the peak from return to cut rose to 45 amp. and dropped down to 20 amp. for 5 sec. before the tool started the second cut, then the current rose to 51 amp. The other cuts and reversals were practically the same, except the curve shows that the motor kept getting faster on the return stroke and the current made a practically straight line for 15 sec., the full return stroke. The full field of the motor was approximately 10 amp.

The upper curve shows our 15-hp. motor driving a 42-in. Pond planer. This is a two-armature motor, capacity 60 amp. This curve shows that at the time this test was taken the cutting speed was 17 ft. per min., return speed 44 ft. per min. Two tools were used, each taking a ½-in. cut and a 3/32-in. feed, cutting cast steel. The shunt field of this motor took 3 amp. To start required a peak load of 40 amp., then, as the speed increased, the current dropped to 10 amp. in 3½ sec. before the tool started to cut, then the current rose to 55 amp. for 33 sec.; then the current was off for 1½ sec. when the return peak rose to 60 amp. and the motor got to full speed in 2½ sec. Then the current dropped to 12 amp. for 13½ sec., then the current was off and so on. This curve shows that the double armature motor drives gets up to speed quickly with peak loads only to the capacity of the motor. Therefore, the motors run cool and without trouble.

*From a paper read before the Association of Iron and Steel Electrical Engineers, New York, September 26. The author is electrical superintendent, American Bridge Company, Philadelphia.

The Steel Corporation's Labor Investigation

Charles M. Cabot, a Boston stockholder of the United States Steel Corporation, has recently corresponded with Chairman Gary concerning the committee created by a resolution passed at the last annual meeting of the corporation to investigate labor conditions at various steel plants. It was provided in the resolution that the committee report by October 1, 1911. In a recently published statement Judge Gary said: "The committee was named soon after the annual meeting. Some of the appointees accepted, others declined. I have had some difficulty in securing a committee of good men, as considerable work is involved. The full number has lately been obtained and has been requested to organize, and I believe they will do so within a short time and on the return of one of the members who is away from home. So soon as the committee is organized I will give out the names. The above information was communicated to Mr. Cabot some days since. There has been no unnecessary delay."

The Washburn Multiple Spindle Drill

A new multiple-spindle sensitive drill manufactured by the Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass., has been brought out to handle drills having a maximum diameter of 9-16 in. Like the motor-driven drill illustrated in *The Iron Age*, September 28, 1911, the new drill is equipped with a belt tightener, which permits the tension of the belt to be varied instantly at the will of the operator, the tension being controlled by automatically locked tighteners operated through a rack and pinion. Fig. 1 shows two views of the drill from opposite sides of the table while details of the oil bath for the spindle pulley are given in Fig. 2.

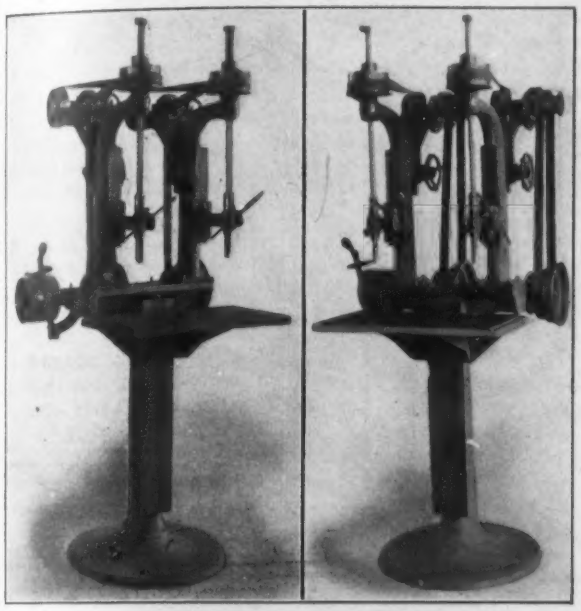


Fig. 1.—Two Views of a New Multiple-Spindle Drill Built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

The countershaft is located at the rear of the column and forms a part of the machine, the drive from this shaft being by an open belt to the back shaft, and then by a quarter-turn belt to the spindle pulley. Both of these shafts have ring-oiling bearings and the spindle runs in an oil bath of an entirely new design, details of which are shown in Fig. 2. The pulley *a* is keyed to the spindle *b* at *c*, and the quill *d* is driven into the column *e* at the point *f*, the column having been bored for this purpose in line with the head bracket. In this way the spindle runs absolutely free at either 610, 1016 and 1830 r.p.m., the tension of the belt on the pulley being taken by the quill. The flange *g* is made a part of the quill instead of forming a part of the pulley. The ring *h* is located within the pulley so as to be concentric with the bearing *d*, the space between the ring and bearing being an oil cup which keeps the bearings flooded with oil while at the same time it also acts as a retainer and prevents the lubricant from spattering.

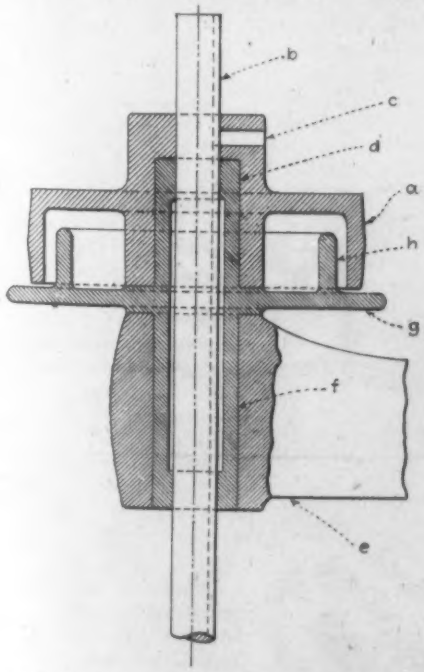


Fig. 2.—Details of the Oil Bath for the Spindle Pulley.

The spindle is bored to conform to a No. 1 Morse taper and when the countershaft is operating at the speed recommended by the builder, namely 610 r.p.m., three spindle speeds ranging from 610 to 1830 r.p.m. are available. These drills are made with two, three or four spindles. The table of the two-spindle machine measures 14 x 28 in., the distance between the center of the post and the center of the spindle is 8 in. and the spindle has a feed of 3 in. The weight of the machine is 715 lb.

The International Motor Company

An organization for selling motor trucks and furnishing service to their owners has been incorporated as the International Motor Company under the Delaware laws, with general offices at 30 Church street, New York. This company, capitalized at $10,000,000, is to have the commercial management and general supervision of the Saurer Motor Company and Mack Brothers Motor Car Company. The manufacturing will be carried on as at present, with the Saurer motor truck plant at Plainfield, N. J., and the Mack Brothers' plant at Allentown. Both companies are to be continued as distinct organizations. A combined output of 2000 trucks is planned for the coming fiscal year. Sales branches and agencies of both the Saurer and Mack Brothers companies will become branches and agencies of the International Motor Company, which will also conduct in all of the principal cities service stations for the most thorough inspection and maintenance of both Saurer and Mack trucks.

The officers of the International Motor Company are: President, C. P. Coleman; chairman of board, W. D. Sargent; vice-president, J. M. Mack; treasurer, F. C. Richardson; secretary, Vernon Munroe. The directors are: Otis H. Cutler, president American Brake Shoe & Foundry Company; Frederick H. Eaton, president American Car & Foundry Company; Benjamin Strong, Jr., vice-president Bankers' Trust Company; Arthur H. Lockett, Pomroy Brothers, bankers; Hunter Marston, Blair & Co., bankers; Charles H. Sabin, vice-president Guaranty Trust Company; George B. Case, White & Case, attorneys; William G. Pearce, vice-president American Brake Shoe & Foundry Company; C. P. Coleman (formerly secretary and treasurer Singer Sewing Machine Company), president Saurer Motor Company; W. D. Sargent, president Reading Steel Casting Company; Herbert H. Dean, Edward B. Smith & Co., bankers; Joseph S. Mack, treasurer Mack Brothers Motor Car Company; Montgomery Hare, attorney; Thomas E. Rush, attorney; Warren A. Wilbur, president E. P. Wilbur Trust Company; Harry W. Davis, secretary Delaware Trust Company; Martin E. Kern, vice-president Mack Brothers Motor Car Company.

There is a special interest in this latest development in the motor truck industry in America which brings into association two of the oldest—perhaps the two oldest—motor truck concerns in the world. Adolph Saurer began building his trucks in 1894 in Switzerland. Four Saurer factories were established in Europe at intervals, and the fifth, which is now associated with the International Motor Company, was started in this country under license a few months ago. The Mack Brothers turned out their first truck in 1900. Their factory now turns out four complete motor trucks a day. The Mack truck was the first successful American-built gasoline truck.

At Hibernia, N. J., October 20, a wall more than 200 ft. thick, which separated the old shaft from a new one that was being sunk in the iron mines of the Wharton Steel Company, was cracked by a blast and water from the old shaft quickly filled the new one, drowning 12 of the 60 miners who were in it. They were more than 1400 ft. under ground when the water poured in.

New Prentice Radial Drill

Machine Equipped Practically Throughout with Ball Bearings

The No. 7 4-ft. arm heavy-pattern drilling machine recently brought out by Prentice Brothers Company, Worcester, Mass., possesses a number of new features which mark it as a distinct advance over its predecessor in this line. In the description of a new 30-in. geared speed change, vertical drilling machine which appeared in *The Iron Age*, April 27, 1911, mention was made that it was the intention of the company to make ball-bearing construction standard throughout its entire line and that experiments with a ball-bearing radial drill were being made. The result of these experiments is the drill shown in the accompanying engravings. The tool is equipped throughout with ball bearings, except in the feed mechanism and these have demonstrated that a saving of 50 per cent. in power is secured in the drilling of any hole with a natural increase in capacity. Speeds as high as 800 r.p.m. are practicable, and the pulling power of the large gear ratio has been demonstrated to operate an 8-in. pipe tap through a 3-in. cast-iron flange. The especially novel points about the new drill are the distribution of the speed-changing mechanism between the speed box and the head, a safety device to prevent the dropping of the spindle counterweight, and the use of a new safety apparatus to prevent the arm from being run too high or too low. Fig. 1 is a view of the drill, while Figs. 2 and 3 show the arrangement of the back gears used in the drill and details of the safety device used to prevent the spindle counterweight from falling in case the supporting chain should break respectively.

The Speed-Changing Mechanism

In the older type of radial there were eight changes of speed in the speed box, controlled by three levers. This has been reduced to four changes with two levers, and the head has been equipped for high and low-speed mechanism, in addition to the back gears which increase the speeds to 16. The upper of the two levers seen at the left of the head controls the high and low speed; the lower, the back gears. The result of this arrangement is that the necessity no longer exists of racing the heavy intermediate shafting and gears between the head and the speed box. The theory is that a very large waste of power is eliminated by this new division of the mechanism. At a pulley speed of 300 r.p.m. the 16 spindle speeds range from 9 to 265 r.p.m. The total gear ratio is 33.3 to 1.

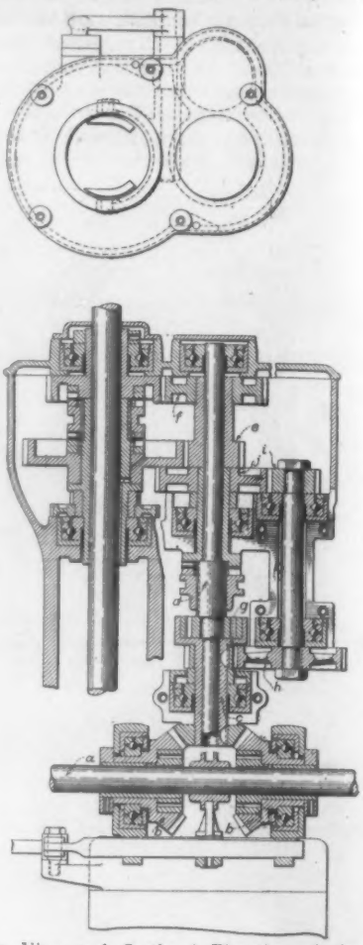


Fig. 2.—Plan View and Sectional Elevation of the Back Gears Used in this Drill.

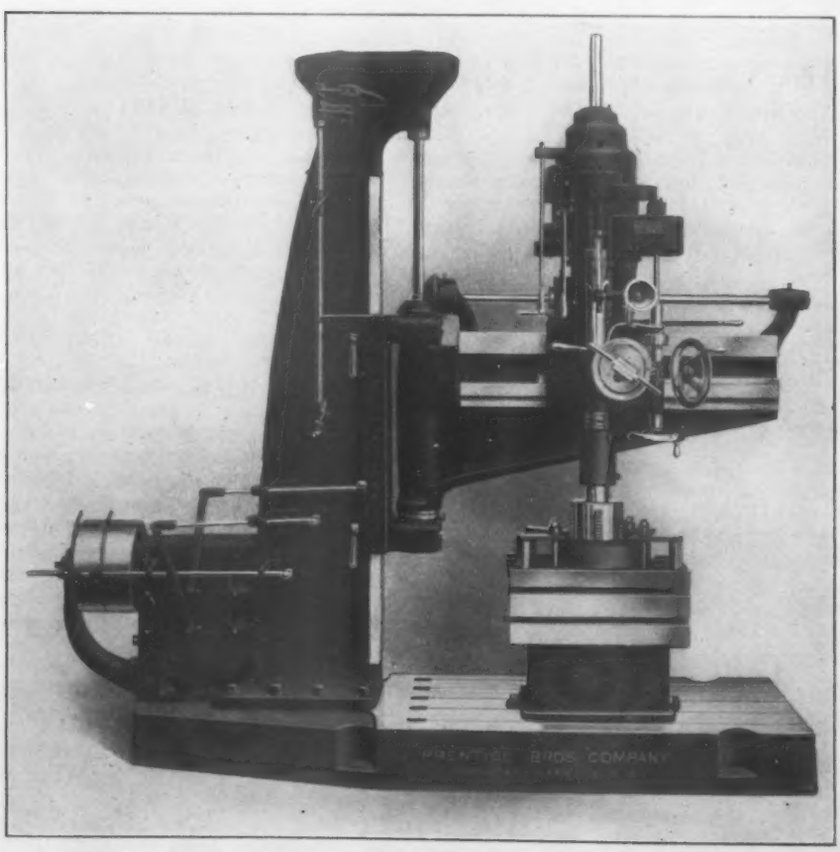


Fig. 1.—The No. 7 Ball-Bearing Radial Drill Built by the Prentice Brothers Company, Worcester, Mass.

The details of the speed-changing mechanism of the head are shown in Fig. 2. The power is transmitted through the horizontal shaft *a* to the reversing bevel gears *b* used for tapping, which deliver their power to the bevel and friction cup *c*. By engaging the internal expanding friction with the cup, the back shaft *d* is thrown into action at the same speed as the bevel gear. On this shaft are keyed the gears *e* and *f*, the former furnishing the slow speed and the latter the high. When the back gears are in operation, the friction spool is disengaged and the clutch is thrown into engagement with an upper clutch sleeve. In this position the power is delivered to the backshaft through the gears *g*, *h*, *i* and *j*.

To obviate a possibility of injuring the gearing by running the arm too high or too low, the drill has been equipped with a new safety-stop mechanism, seen on the side of the column in the photograph. The top of this shaft is connected by levers with the tumbler gears which control the raising and lowering of the arm. A partial rotation of the shaft throws these tumbler gears

out of mesh with the raising screw gear, and the feed stops. On the shaft are two inclined cams operated by the projecting finger on the saddle. The action of this finger against the inclined cam surface causes a partial rotation of the shaft to stop the feed.

The company has applied to this machine a new safety-stop device to prevent the falling of the counterweight of the spindle in case of the breaking of the chain. This

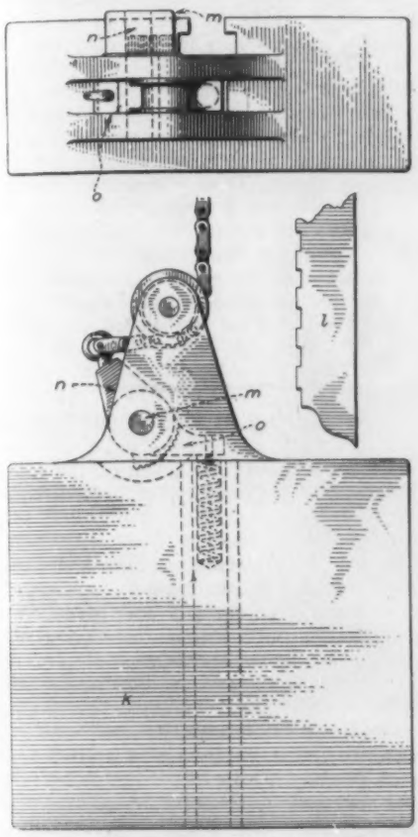


Fig. 3.—Details of the Safety Stop Motion.

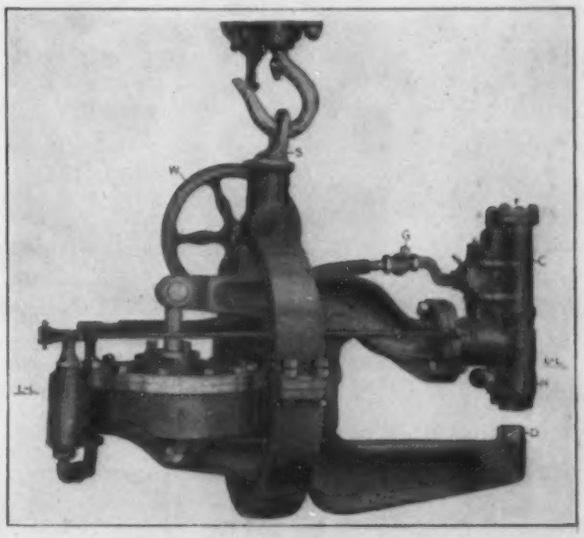
mass of metal hangs open, suspended by a chain, the breaking of which may result in a serious accident. The safety device is designed absolutely to hold the weight in any position it may be at the moment of breaking of the chain. The weight *k*, Fig. 3, travels in a guide, a front view of which is seen at *l*. Through the ears of the weight is the short shaft *m* upon which are keyed a toothed eccentric *n* and a projecting finger *o*. At the end of the eccentric piece is the eyebolt to which is fastened the chain that passes under a sheave and upward. The projecting finger *o* rests against a powerful coiled compression spring which sets in a hole drilled in the weight. The edge of the guide is closely notched to assist the function of the toothed eccentric cam. Therefore, upon the breaking of the chain the compression spring acts instantly to throw the toothed surface of the eccentric against the notched edge of the guide, the combination of cam form and irregular surface serving to hold the weight in essentially the position it occupied when the chain parted.

The Reading Iron Company's Improvements.—The rebuilding of the Ninth street mill of the Reading Iron Company, Reading, Pa., has been practically completed and it is running full. The entire building has been rebuilt, structural iron columns having replaced wooden supports. The mill continued in operation during the reconstruction work, except when temporarily interfered with by the erection of some of the columns. The improvement places this mill in first-class condition, modern machinery having been introduced several years ago. It furnishes skelp to the tube department of the company's plant. The rebuilding of the No. 5 mill on South Seventh street will now go forward, the contract having been awarded to L. H. Focht & Son. This building will be similar in design and construction to the No. 6 mill at Seventh and Laurel streets. The Reading Iron Company has made most remarkable progress in the modernizing and rebuilding of its various plants. Old wooden buildings are being replaced by steel structures and the equipment of its various mills has been rapidly brought up to the best modern practice.

New Allen Riveter Hammer

A notable addition to the line of hammer riveters built by the John F. Allen Company, 370 Gerrard avenue, New York, N. Y., has recently been made. This riveter, on account of its shorter reach and lighter weight, is intended for work that is beyond the scope of the regular builder's boiler riveter machines. The reach is 15½ in., and it possesses sufficient power to drive rivets from ⅜ to 1 in. in diameter.

In operation the work to be riveted is placed so as to bring the rivet head on the die D with the free end of the rivet pointing toward the axis of the hammer cylinder C. Upon moving the handle B toward C air is admitted to the cylinder A. This closes the arms X and Y and a pressure of about 4000 lb. holds the plates to be riveted firmly between the die D and the nozzle N. When the button G is pressed air at a pressure of from 60 to 100 lb. is admitted to the cylinder C. This causes the hammer to



A New Hammer Riveter Made by the John F. Allen Company, New York, N. Y.

strike the end of the rivet a series of quick blows, thus heading the rivet in a few seconds. Releasing the pressure upon the button G arrests the motion of the hammer. A movement of the handle B toward the rear of the riveter opens the arms X and Y at once and releases the plates which are moved into position as soon as the rivet is inserted and the riveting operation repeated.

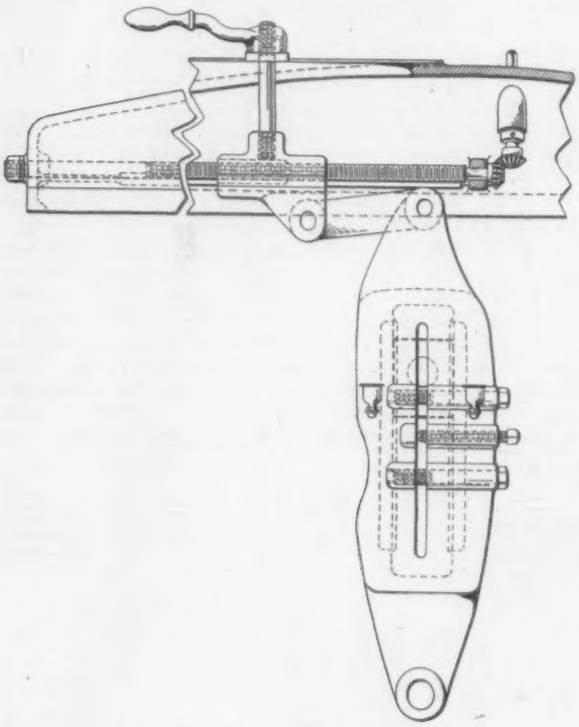
The machine is in balance when suspended from the hook S and can be swung in any direction. It is turned on its long axis L by the hand wheel W, which operates a worm engaging the worm wheel inclosed in the supporting ring R.

William J. Linton, manufacturers' agent, has removed from 136 Liberty street to more commodious offices at 90 West street, New York City. His business connections are now such that he can submit proposals on power plant equipment, either new or used, erected on foundations and installed ready for operation. This feature is expected to prove a great convenience to many who are considering the purchase of either steam or electric power plants.

The Russian Minister of Commerce has introduced into the Duma a bill for the promotion of Russian shipbuilding. It provides for bounties of 75 rubles (ruble = 51.5 cents) per ton of gross capacity and 135 rubles per indicated horsepower for steel ships constructed in Russian yards of Russian raw material, and bounties of 2 rubles per pood in the case of ships built in Russian yards of imported raw material. The law is to remain in force for 15 years.

Lubrication of Queen City Shaper

The lubrication of machine tools is a small but comparatively important question, and after considerable experimental work the Queen City Machine Tool Company, Cincinnati, Ohio, has decided to equip all of its shapers



The Sight Feed Method of Lubricating the Ram Bearing of Shapers Used by the Queen City Machine Tool Company, Chincinnati, Ohio.

with a sight feed lubricator on the ramway of each side of the machine. How this is accomplished, together with the lubrication of the sliding block bearings in the rocker arm is brought out in the accompanying illustration.

The lubricator, which is made by the D. T. Williams Valve Company, Cincinnati, Ohio, is placed near the center of the ram guide bed and the oil is distributed over the entire bearing regardless of the length of the stroke. This distribution of the lubricant is facilitated by grooving the clamps and the ram slide. This arrangement does away with the pouring of oil into four or five oil holes at each side of the shaper, which frequently become clogged with dirt when it is necessary to lubricate the ram bearings.

For lubricating the sliding block bearings and the rocker arm an ordinary brass oil cup loosely packed with a small piece of waste is placed on each side of the rocker arm. A hole for a small tube leading to the sliding block bearing is drilled through the rocker arm and at each stroke of the machine sufficient oil is fed to the bearings. This method of lubrication saves the operator time, since the oil cups require filling once in every three or four days. Another advantage of this method of lubrication is the matter of cleanliness, which while a comparatively small factor is nevertheless something worthy of consideration.

The contract for 2000 tons of rails, to be delivered at Moncton, N. B., for the Transcontinental Railway, has been let to the Dominion Steel Corporation, of Sydney, Nova Scotia.

St. Louis Blast Furnace Company Litigation

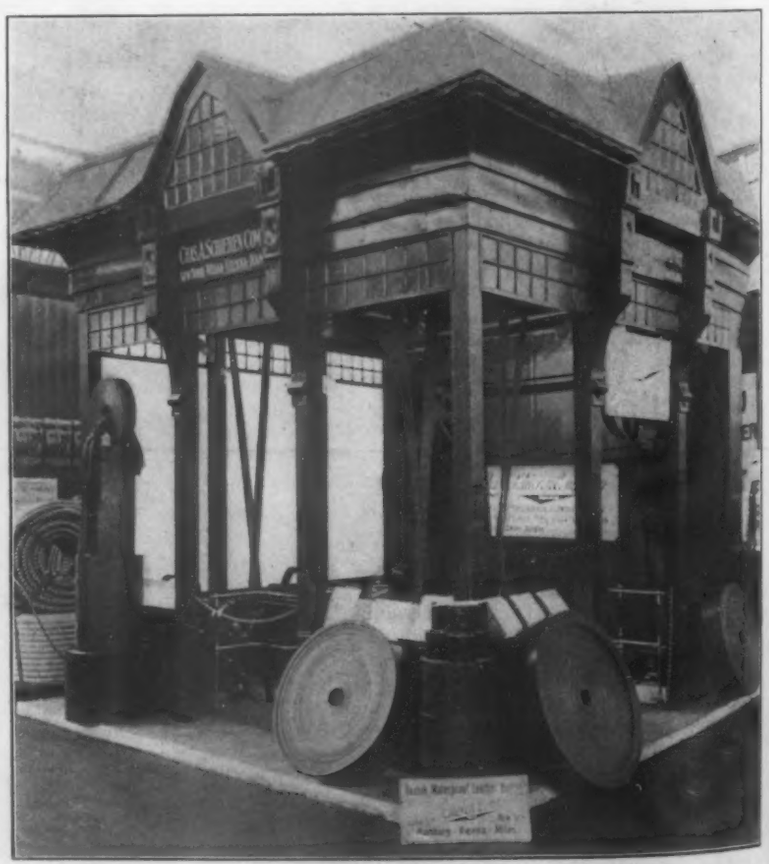
Application for a receiver for the St. Louis Blast Furnace Company was made at St. Louis October 20 in the United States Circuit Court by the Whitney-Kemmerer Company, of Pennsylvania. The petition alleges that on January 1, 1910, the company issued through the St. Louis Union Trust Company $200,000 in first mortgage bonds. The petitioners hold $6,000 of these bonds. The petition also alleges that the company is insolvent, unable to pay its debts and without sufficient funds to operate. A temporary court order restrains the company from doing any further business until the litigation is disposed of. About two weeks ago a foreclosure sale of $124,000 of the company's bonds was had on a loan of $62,000 made by a local bank, and the collateral was bid in by the bank.

The defendants in the present suit are the company, the St. Louis Union Trust Company, trustee for the bonds; the McPheeters Warehouse Company and A. P. DeCamp, president of the furnace company. Mr. DeCamp says that the company has assets considerably in excess of its liabilities; that the great majority of the creditors are satisfied with the present handling of the affairs of the company, and that he is satisfied the petition for a receiver will be dismissed.

Schieren Belting at the Turin Exposition

An illustration is herewith given of the exhibit of the Charles A. Schieren Company, manufacturer of leather belting, Schieren Building, New York City, at the Turin Exposition, now being held in Turin, Italy. This exhibit was arranged in an attractive pavilion and comprised impressive specimens of the products of the company. There were also shown seven unusual and hard belt drives, all running under one roof. One of these drives was running with one of the company's Duxbak waterproof belts continually saturated with water. The space was favored with a visit from the King of Italy, who pronounced the exhibit exceedingly interesting and instructive.

On October 17 the company was advised by cable that it had been awarded the Grand Prix for its exhibit. Last year it was awarded the Grand Prix at the Brussels Exposition.



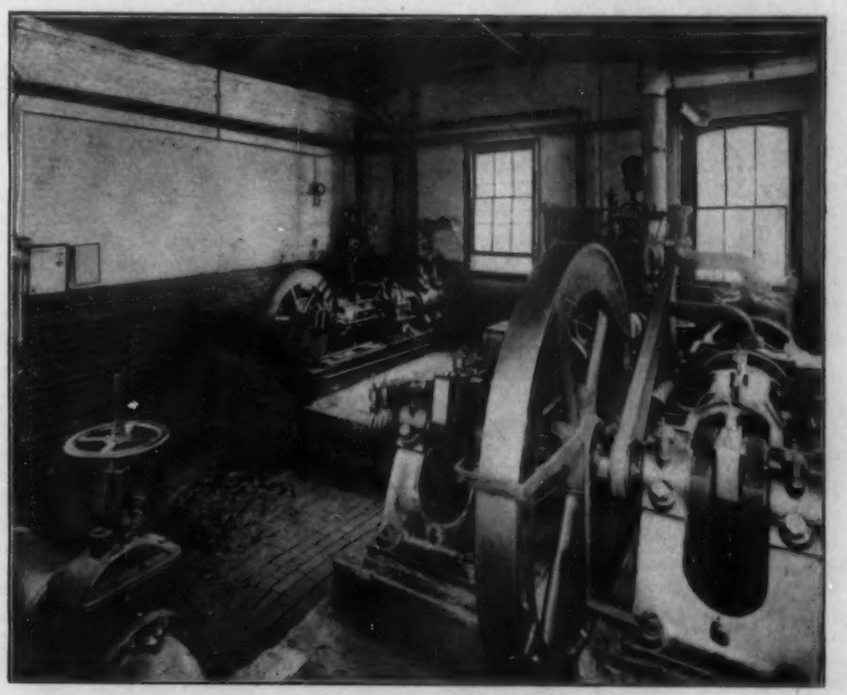
The Charles A. Schieren Company's Exhibit of Belting at the Turin Exposition.

High Pressure Gas Distribution

How the Public Service Supply Was Increased at Flushing, N. Y.

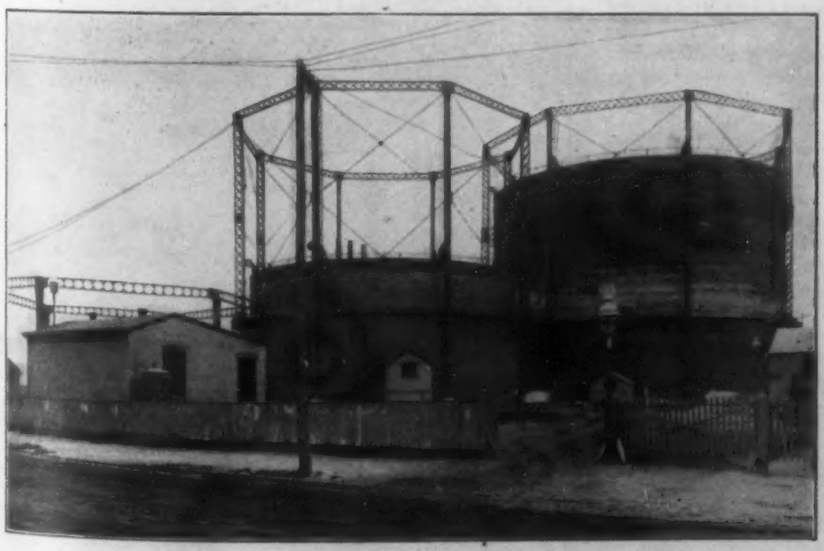
An example of the progress made in the high-pressure system of gas distribution, doing away with unsightly gas holders and introducing various economies, is had in the installation of the New York & Queens Gas Company at Flushing, Long Island, N. Y. Here a low-pressure system was transformed into a high-pressure system.

The district served is a large and growing one and the demands on the equipment had reached such a point that it was necessary either to lay more or larger distributing mains or install another district holder, or by some other means increase the pressure to supply the distant consumers. A large drop in pressure was shown by gauge readings, for at the works there was a 5-in. water pressure, but at Bayside, 7 miles away, there was only 1½ in. water pressure. As the cost of compressors was small compared with that of a gas holder, it was decided to install 4 mi. of high-pressure main and deliver the gas at 3½ in. pressure into the low pressure on the line feeding Bayside, so that it would increase the pressure both ways.



Interior of Compressor House of the Flushing, N. Y., Gas Works.

A small compressor house was built at the works and two Laidlaw-Dunn-Gordon duplex steam-driven gas compressors were installed. The large one has 12-in. steam and 16-in. gas cylinders with a stroke of 12 in., uses steam at about 100 lb. and compresses the gas to 50 lb., while the smaller compressor has 8-in. steam and 14-in. gas cylinders with an 8-in. stroke. The compressors are connected so that either can be run independently of the other or both at the same time. The small one is generally in service during the day when the load is comparatively light, and the large one from 5 o'clock in the afternoon until 10 at night; or, should the load be exceptionally heavy, both can be used. Gas enters the compressors at a pressure of 5 in. of water and is discharged into the mains at 30 lb. per square inch at the rate of 40,000 cu. ft. per hour. Before entering the mains it passes through controlling and check valves, the latter preventing the gas from returning to the compressors.



Relative Unobtrusiveness of Compressor House at Left Compared with the Gas Holders.

The distributing system comprises 4 mi. of high-pressure mains and 84 mi. of low. The former are of 4-in. wrought pipe having recessed screwed couplings with the threads covered with red lead and shellac before making up. Every 400 ft. an expansion coupling is inserted and at every 1000 ft. a gate valve. The fittings were furnished by the Dresser Mfg. Company, Bradford, Pa., and the valves were made specially for gas tightness at high pressure by the Eddy Valve Company, Waterford, N. Y., and the Ludlow Valve Mfg. Company, Troy, N. Y. At the end of the 4 mi., the 4-in. line is connected to a 20-in. line. Gas is introduced into the latter through two Reynolds regulators set in a manhole in the street. From the high-pressure mains consumers are fed through service pipes, in each of which before entering a house is a regulator for reducing the pressure. In the low-pressure part of the system no regulators, of course, are required, the usual cocks only being fitted.

High-pressure gas does away with the unsightly district holders, as stated, with their great initial cost. Maintenance costs are also greater, it is understood; than those of the compressors. Smaller pipes can be installed and as a distributing system covers many miles, the saving in cost of piping often may be of very large proportions. The cost of compressing gas at the New York & Queens Gas Company, according to M. H. Spear, secretary and manager of the company, does not exceed 2 cents per 1000 cu. ft. The fluctuation in pressure is of course discernible in the lights.

Governmental repairing of ships is suggested by the Isthmian Canal Commission as a means for utilizing the admittedly complete machine shops on the Canal Zone after the Panama Canal is completed. The adoption of such a plan will doubtless be objected to on the ground that the United States is entering into competition with private enterprise. Certain it is that ships arriving at the canal after long voyages are likely to need repairs to engines and hulls, and projectors of the scheme feel that such work may well be undertaken by the canal administration for fair prices in addition to levying tolls and maintaining the waterway.

Tests of Pulleys

Transmission Capacity of Different Pulleys with Leather Belt Drive

The findings of an extended series of tests of different kinds of pulleys transmitting power by means of leather belts, conducted on a belt-testing machine in the laboratory of Sibley College, Cornell University, were reported in a paper presented before the National Association of Cotton Manufacturers at its recent meeting at Manchester, Vt., by Prof. Will Miller Sawdon. The work was undertaken at the request of the Rockwood Mfg. Company, Indianapolis, Ind., and the tests were all made with single-ply oak-tanned leather belts, 5 in. wide and 0.224 in. thick, and 33 ft. long. The pulleys were all nominally 24 in. in diameter with an 8-in. face. A constant belt feed of 2200 ft. per minute or 348 r.p.m. of the driving pulley was maintained throughout. Cast-iron, wood and paper pulleys were used, including those with cork projections. Some idea of the extent of the tests may be gained when it is stated that for cast-iron pulley tests alone nearly 9000 observations of the slip of the pulleys were taken.

It is to be remembered that in order to transmit power from one pulley to another there must be a difference in the tensions set up between what is called the tight and slack sides of the belt. The capability to produce this difference depends in part on the nature of the two surfaces. That pulley is best in which the measure of friction of the pulley on the belt surface is the greatest and the slip is the least. The tests show that for slips of 1 to 2 per cent., as commonly used in practice, the plain cast-iron pulley has the lowest values of coefficient of friction and the plain paper pulley has the highest. The values of the plain wood pulley lie between these limits. An interesting feature is that wood pulleys up to ½ per cent. slip follow very closely the performance of the paper pulleys, after which the slip increases rapidly and at 1 per cent. the coefficient of friction is only approximately a mean between those of the cast-iron and the paper pulleys. Beyond 3 per cent. slip the coefficient of friction is less than that for cast iron. This condition explains in part a commonly accepted understanding that the wood pulley has a small capacity for carrying an overload. To accept overload capacities as much as 50 per cent. of the normal load, the wood pulleys must be designed larger in diameter or for use with a wider belt than the normal load would demand.

Pulleys with cork inserts made under specifications for 1¼-in. diameter, xx straight mucilage corks by the Armstrong Cork Company, set in 1 1/16-in. diameter sockets and spaced 2¼ in. between centers and of composite construction were tested. This gave a cork area of from 37 to 39 per cent. of the total pulley face. It is general practice to make the cork area from 25 to 33 1/3 per cent. of the total area. Two separate and complete tests were made on the cork insert pulleys, one for a projection of the corks of approximately 1/34 in. beyond the pulley face and the other for a projection of approximately 1/64 in.

In the case of the cast-iron pulleys, each of the cork-insert curves shows a material increase in the values of the coefficient of friction at lower slips and running up to 3 per cent. For the longer corks the values of the coefficient of friction between 1 and 6 per cent. slip are close to those of the plain wood pulleys. Below 1 per cent. slip the wood pulleys have the higher values. With the shorter corks, considerable advantage is shown over plain cast-iron pulleys as well as plain wood pulleys up to about 4 per cent. slip, after which the coefficients are but little higher than for the plain cast iron. Either of the cork-insert cast-iron pulleys, however, shows a large overload capacity at high slips.

In the wood pulleys the cork inserts slightly increase the transmitting capacity for very low slips and up to about ½ of 1 per cent. Between ½ and 1¾ per cent. slip the plain wood pulleys have the higher values, while beyond 2½ per cent. the cork inserts again show an advantage. This is particularly interesting in that, though capable ultimately of carrying much greater loads, through the allowable ranges of slip, the cork inserts actually prove detrimental.

The tests on the paper pulleys with cork inserts are also interesting in that in each case the use of cork inserts has proven detrimental to the transmitting capacity of the pulleys for practically the entire range of slip. For the longer cork projection this is more marked than for the shorter. Unfortunately, in the paper and in the cork pulley tests, the capacity of the machine did not permit of higher loads being carried to determine the maximum values of the coefficient of friction and corresponding slips.

The Dreses 6-Ft. Radial Drill

One of a New Line Generously Supplied with Ball Bearings

A new line of plain radial drills with 5, 6 and 7 ft. arms has been developed by the Dreses Machine Tool Company, 227 West McMicken avenue, Cincinnati, Ohio. Several changes have been made in the design of these tools from those formerly built, the more important being the adding of an extra bearing for the head on the rear of the arm and mounting the spindle driving gear on ball bearings to reduce the friction exerted on this part by the pull of the spindle as it is being fed downward. Fig. 1 shows the middle, or 6-ft. size, while Figs. 2 and 3 illustrate details of its construction, being a section through the column showing the arrangement of the inner and the outer members and a rear view of the head respectively.

The column, as will be seen by referring to Fig. 2, is made in two sections, the outer one swinging on an inner fixed column that reaches nearly to the top. The diameters of both are greatly increased at the lower end and there is a third bearing at the point *a* which adds strength and rigidity. A place for a large roller bearing to rest and swing on is provided by the reinforced portions as well as means for clamping the column easily and firmly. The clamping handle is always within easy reach of the operator since it follows the arm, and no pressure is exerted on the rollers of the bearing when the arm is clamped in position. These rollers are tapered and of large diameter and are protected from chips and dirt.

Box construction is employed for the arm which is parabolic in elevation. A conveniently located handle raises and lowers it at a ratio of 2 to 1 and to prevent the arm from being moved too far in either direction, an automatic knockout is furnished at the top and bottom. The thrust of the elevating screw is taken up by a ball bearing. Long and wide bearings are provided for

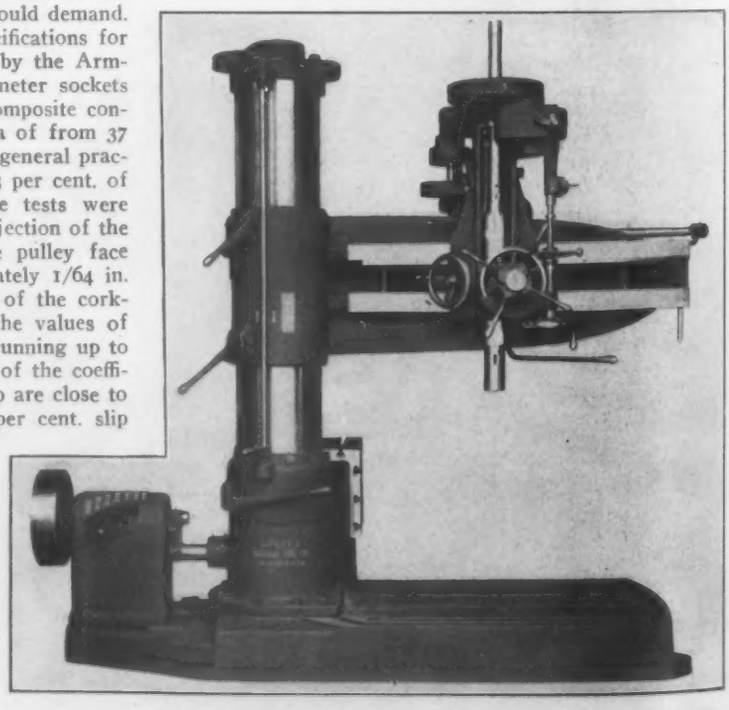


Fig. 1.—The New 6-Ft. Plain Radial Drill Built by the Dreses Machine Tool Company, Cincinnati, Ohio.

the head on the face of the arm, and in addition there is a third bearing on the rear of the arm formed by the back gear bracket as shown in Fig. 3. This additional bearing adds to the support of the head, distributes the torsional strain over the whole arm, which is an important feature, and eliminates bending and strain of the rear shaft and rapid wear of the bevel gears and their bearings. A single handle on the left side of the head above the face of the arm serves to clamp and release the head. A compound spiral-gear arrangement and the third support in the rear enables it to move easily along the arm.

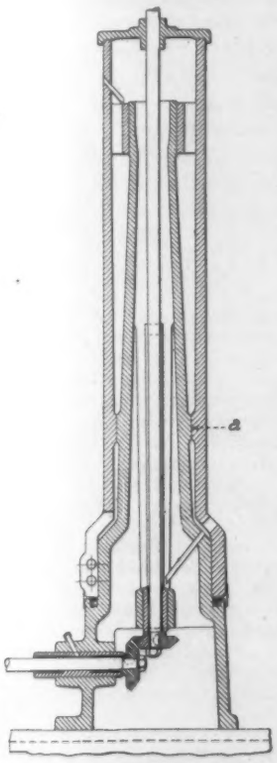


Fig. 2.—The Arrangement of the Inner and Outer Columns.

In the design of the spindle driving gear an important improvement has been made to reduce the friction to which this gear is subjected by the pull exerted upon it when the spindle feeds down. This has been done by making the spindle driving gear rest and revolve on a ball bearing. The mechanism for the feed which is of the all-geared type is inclosed in a small case. Eight changes in all are available; four of these ranging from 0.007 to 0.022 in. per revolution of the spindle are secured by the little handle on the feed shaft at the right of the head and are increased from 0.026 to 0.80 in. by the little crank above, both being within easy reach of the operator. The use of a ratchet clutch enables the hand feed to work ahead of the power feed.

A swinging dog attached to an extension on the spindle sleeve is brought into contact with an adjustable dog on the feed bar and there is a graduated scale by which the depth of a hole can be gauged from zero fixed

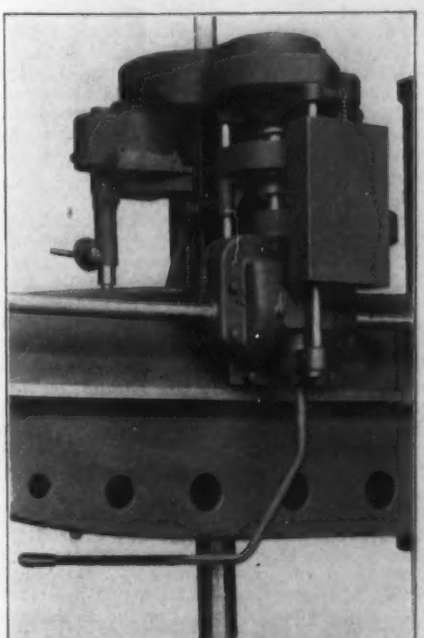


Fig. 3.—Rear View of the Head Showing Bearing on Back of Arm.

to this adjustable dog. Several of these dogs can be put on the feed bar and the swinging dog brought into contact with them successively for different depths of holes. A safety release for the end of the feed is provided. The quick advance and return device has four levers, any one of which engages and disengages the feed instantly and also serves as a pilot wheel for hand operation of the spindle.

The starting, stopping and tapping mechanism, which is of the friction type, is embodied in the head and operated by the horizontal lever shown below the arm in Figs. 1 and 3. The large diameter friction bands are double expanding and are made of phosphor bronze to avoid cutting. The bevel gears containing the frictions run in an oil bath. The speed-changing lever on the head enables the tap to be backed out at 2½ times the cutting speed. Three speed changes, rendering 21 different spindle speeds available, are provided for the head, the arrangement being patterned after automobile transmission gearing.

Any desired speed can be secured without stopping the machines. The speed variator is of the tumbler-gear type and has seven changes. The teeth are of the 20-deg. involute pointed form to insure strength and easy engagement. To overcome momentum when starting the speed variator runs at the slowest speed at all times and is provided with the builder's self-releasing overtake clutch which was illustrated in *The Iron Age* of August 13, 1908. In the variator one gear runs loose on the variable-speed shaft and is clutched by four pawls located in fixed gears mounted on this shaft. These pawls are kept in contact with the inner surface of the gear by spiral springs and will release the two gears when the fixed ones run faster than the loosely mounted one.

Three sizes of tool with arms 5, 6 and 7 ft. long are built and range in weight from 10,000 to 16,000 lb. In a test of the middle size an 8-in. pipe tap was fed in a 2½-in. plate and a hole was drilled in cast iron by a 4-in. high-speed drill at a cutting speed of 100 ft. per minute and a feed of 0.027 in. per revolution of the spindle.

Railroad Appliance Exhibition.—The annual exhibition of appliances used in the construction and maintenance of steam and electric railroads will be given by the National Railway Appliances Association at the Coliseum and First Regiment Armory in Chicago March 18 to 23, inclusive, 1912. This is the week during which the American Railway Engineering Association will hold its thirteenth annual convention, and the Railway Signal Association will hold its spring meeting. The Railway Appliances Association has been incorporated under the name of National Railway Appliances Association with offices at 537 South Dearborn street, Chicago. The price of the floor space will be 45 cents per sq. ft., the additional charge of 5 cents per sq. ft. over last year having been made because of the necessity of buying fixtures this year, instead of renting them as heretofore. The first allotment of space will be made on or about November 1. It is advisable to have all applications for space in the hands of the secretary, Bruce V. Crandall, 1400 Ellsworth Building, 537 South Dearborn street, Chicago, before that date.

The Disco self-starter for gas and gasoline engines is hereafter to be made in Detroit, where the Ignition Starter Company has located both its factory and offices to secure increased production facilities. Communications should be addressed to the company at 724 Ford Building, Detroit. The self-starter comprehends an arrangement by which acetylene gas, such as is obtainable from the acetylene lighting tank found on the automobile, delivering the acetylene gas to each of the cylinders of the engine and then exploding the gas by use of the ignition system. In the case of automobiles, the visible portion of the self-starter is a small crank on the dashboard.

Illustrations of lathe chucks of a wide range of types, accompanied with brief descriptive matter and tables necessary for those planning to make intelligent selection of chucks, are printed on single sheets of paper of letter size by the Skinner Chuck Company, 94 Reade street, New York City, for such use as attaching to correspondence of, for example, machinery dealers, where such literature would be distinctly appropriate. A group of the leaflets, fastened together, can undoubtedly be had for the purchasing agent's or superintendent's library.

The Machinery Markets

The machinery trade in the East is still looking forward to the expected railroad buying and in the meantime orders and inquiries for small amounts of machinery are coming from the general manufacturing field. An improvement is noticed in Philadelphia and the railroads are asking for bids on some single tools. The Chicago trade is bidding against a small list of machine tools and the trade has just filled a good-sized order placed by a local steel company. Second-hand machinery is scarce in Chicago. The Cleveland market is quiet, but a good demand exists for handling equipment, such as hoists, cranes, etc. Inquiries are coming out more freely in Cincinnati, but prospective purchasers are slow in closing orders. There are increased inquiries in Detroit and small power electric units are selling well. In St. Louis the machine tool market is improving and there is an increased demand for second-hand machinery. Most of the buying in that market is for small lots of machines. Business is generally dull on the Pacific Coast, although the demand is excellent for equipment for municipal power plants.

New York

New York, October 25, 1911.

Machinery dealers are awaiting news from the railroads, as it is expected that a number of those mentioned in these columns last week will come forward with lists in the near future. The Delaware, Lackawanna & Western and the New York Central will probably be the first to buy. The latter company is expected to make purchases against the list it has had before the machinery trade for a long time. There are a number of new projects in the way of small manufacturing enterprises in this vicinity that will call for machinery expenditures, and inquiries are good. Dealers continue to get some good business from auto truck manufacturers in the East and there is a fair amount of steady buying of small lots of tools. The contractors on the New York subway work are good customers at this time for outdoor equipment and small lots of metal working machinery which will be used for temporary repair shops established along the work. The Public Service Commission recently awarded another sectional contract for subway extensions to the Lexington avenue division to the Hagerty-Drummond Company, Philadelphia, which will do more than $3,000,000 worth of contracting work on the extension. The W. H. Atwood Reaping & Mowing Machine Company, Hoosic Falls, N. Y., has been making some purchases of machinery in this market for a factory extension and the Baron de Hirsch Fund Trade School is expected to spend some money soon for metal working equipment to be established in a six-story extension to its manual training department.

The Dixon Cascade Pump Company, Inc., 17 Canfield street, Newark, N. J., will erect a new plant at the corner of Badger avenue and Runyon street, Newark, for the manufacture of its centrifugal pumps. The plant will be 75x200 ft. and one story. The company proposes to spend about $10,000 for new machinery and its entire expenditure will be $50,000.

An extensive addition is to be made to the plant of M. Gould's Son & Co., manufacturers of trunk hardware at 61 Hamilton street, Newark, N. J. The addition will consist of a four-story brick building, 35x85 ft. Fred A. Phelps, whose office is in the Union Building, Newark, is the consulting engineer.

James Stewart & Co., 30 Church street, New York, have been awarded the general contract for the construction of a plant at Edgewater, N. J., for the Midland Linseed Company, of Minneapolis, Minn. Bids are now being taken on the machinery and power equipment.

A two-story automobile service building is to be erected at 588 Broad street, Newark, N. J., by Eisele & King. The building will be 28x90 ft. and will include a machine shop.

The Celluloid Company, Newark, N. J., which has in the past been a generous purchaser of machinery in the New York market, is erecting a two-story brick addition to its plant, 51x66 ft., at a cost of $10,000.

The American Railway Supply Company, 24 Park Place, New York, has had plans prepared by Van Vleck & Goldsmith, 111 Fifth avenue, for a two-story brick factory building, 51x87 ft., for the manufacture of brass tags and badges. The company will move its equipment from its present quarters, but will need a new 24 or 25 hp steam engine and boilers.

The Nestor Film Company has under course of erection a factory building, two stories, 20x100 ft., at Avenue E and Forty-third street, Bayonne, N. J. The company has temporary offices at the works and will soon be ready for equipment for the making of moving picture appliances and films.

The Acme Sheet Metal Company, Jersey City, N. J., has been incorporated with $50,000 capital stock. The company is having plans prepared for a factory for the manufacture of steel ceilings, etc. The incorporators are N. C. Duane, N. E. Wiggins and George W. Everitt. The company has temporary offices at 257 Broadway, New York.

The Zaremba Company, Buffalo, N. Y., maker of evaporators, vacuum evaporating apparatus, etc., has leased a factory building at Elk street and the Buffalo Creek Railroad, in which necessary manufacturing equipment will be installed.

The Thomas Motor Cab Company, Buffalo, has removed its plant from the Century Telephone building, Elmwood avenue and the New York Central Railroad belt line, to the southwest corner of West Mohawk and Staats streets, where it is occupying a three-story and basement building with an area of over 30,000 sq. ft.

The Buffalo Box Factory, Buffalo, is building an extensive brick addition to its plant at Scoville street and the Pennsylvania Railroad.

The Onondaga Brass Company, Syracuse, N. Y., has been incorporated to take over the business of a company of the same name. The management and officers of the company will remain the same as before its incorporation. No additional machinery purchases are contemplated for the present.

The city of Syracuse, N. Y., will erect a vocational high school to cost about $280,000, from plans of Architects Merrick & Randall. Considerable machinery and power equipment, metal and woodworking tools will be required.

The Central New York Gas & Electric Company has completed plans for the enlargement of its power plant at Geneva. A new boiler of 520 hp. capacity and other equipment will be installed, the total cost of the improvements amounting to about $40,000.

The Volney Paper Company, Fulton, N. Y., is taking figures for an addition which it contemplates making to its present three-story factory building.

The Salamanca Furniture Company, Salamanca, N. Y., is having plans prepared for a four-story and basement factory building 53x159 ft., which it will erect this winter or early in the spring.

The Salamanca Mirror Company, Salamanca, is taking bids for a one-story brick factory building 55x160 ft. Grinding and polishing machinery equipment will be required.

The National Iron Foundry & Supply Company, Williamsport, Pa., has completed plans for the building of a plant at Oneida, N. Y., and construction work will be commenced this fall.

The Mohawk Hydro-Electric Company, Ephratah, N. Y., has been authorized by the Public Service Commission to issue bonds to the amount of $56,000 for the purpose of making improvements to the power plant recently leased from the Fort Plain Gas & Electric Light, Heat & Power Company at Nelliston, N. Y., and the construction of transmission lines.

The Motor Specialties Company, Oswego, N. Y., has been incorporated with a capital stock of $175,000 to manufacture motors, engines, motor-vehicles and motorboats. Among the incorporators are Arthur Lovell, Plainfield, N. J., and Howard H. Williams, 31 Nassau street, New York city.

The Ideal Wrapping Machine Company has been incorporated with $150,000 capital stock at Middletown, N. Y., where it will establish a plant for the manufacture of wrapping machines, &c. The incorporators are Olin S. Fellows, Archibald E. Hopkins and Frederick B. Williams, Middletown.

The Lakeside Forge Company has been incorporated at Erie, Pa., by Frederick Bell McBrier and others, to manufacture iron and steel forgings. The capital stock is $100,000.

THE MACHINERY MARKETS

New England

BOSTON, MASS., October 24, 1911.

The dealers in machine tools and other manufacturing equipment have had a quiet week. No new lists are out, so far as can be learned, and trade is generally dull. The Boston & Maine Railroad has made much progress in preparing the ground for the great locomotive and car repair shops at Billerica, Mass., and the work of erecting the buildings will proceed without delay, with the prospect of having them ready for occupancy in 1912. The list of equipment should be one of the largest, if not the largest, ever placed in New England, for the enterprise entails a total outlay of between $2,500,000 and $3,000,000.

Protracted rains have relieved many industries by giving them their full water power and the promise of a continued supply for the winter. Much anxiety had existed that the reservoirs and natural sources would not be renewed before winter had set in, which in this section means waiting for the thaws of late winter. The situation in New England regarding labor is excellent, hardly a murmur being heard in any industrial lines. Significance is placed on the fact that most industries which manufacture for the ultimate consumer, to meet the thousand and one wants of daily existence, are satisfactorily busy, and in many cases filled up with orders. Some improvement is noted in the textile industries. It is significant that in spite of the protracted reduced activities of the cotton mills the companies have not found it necessary to reduce their regular dividends.

The Vibrationless Pneumatic Tool Company, 260 North street, Concord, N. H., manufacturer of vibrationless tools for the stone and iron trades, is in the market for a turret lathe, engine lathe, milling machine, cylindrical grinding machine and a drill press. The corporation has just been reorganized and has established works at Concord. J. C. Coulombe is the president; C. J. French, mayor of Concord, vice president, and A. K. French, secretary and treasurer. The product includes pneumatic riveters.

The entire business of the American Ship Windlass Company, Providence, R. I., will be moved to Philadelphia, and its departments housed with those of Williamson Bros. of that city, who are the owners of the Providence industry. The windlass end of the business went to Philadelphia some months ago, but the automatic stoker department remained, and in Providence it was hoped that this would continue. The owners deemed it wise, however, to concentrate the works.

The Norton Grinding Company, Worcester, Mass., gave a demonstration of a new car axle grinding machine at its works, October 18 and 19, at which were present a large number of representative railroad men. The machine is semi-automatic in its operation, including the handling of the 800-lb. axles, pneumatic power being employed in bringing the centers into position and in releasing them, and in lifting the work that its ends be reversed. The contention is that by grinding axles the diameter of the bearings are reduced less than by turning; a more perfect cylinder is obtained, and the speed of production is greater.

Interior New England must profit more than most industrial sections of the country by the development of water power, for the cost of coal is high owing to distance from tidewater and the long all-rail haul. Already the cheaper power has resulted in the further development of manufacturing plants on a large scale, where otherwise extensions would have been carried on elsewhere. It is therefore of vital interest to many manufacturers that the Central New Hampshire Power Company has been organized on an apparently substantial basis to develop the power of New Hampshire's streams draining 1,500 sq. miles of territory, admirably adapted to the concentration of water in storage reservoirs. The engineers who have been over the situation carefully estimate a potentiality of nearly 100,000 guaranteed 10-hour hp and some 20,000 secondary hp. Robert C. Bacon, Brattleboro, Vt., is the president of the corporation, which has a Maine charter, with authorized capital stock of $15,000,000. The plan calls for the establishment of 17 power plants, together with numerous reservoirs, so located that water can be used over and over again, in some cases as many as five times. The topography of the country makes the creation of reservoirs, comparatively speaking, inexpensive. Sugar River will develop 42,000 hp in five stations; at Claremont, Chandler, Newport, Croydon Flats and Pollard's Mill; Contoocook River, 34,000 hp in five developments, at Penacook, Contoocook village, West Hopkinton, Henniker and Hillsboro; Blackwater River, 9700 hp in two stations, in Webster; Warner River, 2500 hp at Davisville; on Smith River, 7000 hp at Danbury; and on the Mascoma River 10,000 hp at Lebanon. The distance of transmission to industrial centers further south in New England is by no means excessive in any instance.

Philadelphia

PHILADELPHIA, Pa., October 24, 1911.

While there has been no marked gain in the volume of business transacted by merchants or manufacturers in this territory, orders have been in somewhat larger number and the trade is more encouraged with the outlook for the future. Buying is, however, still confined to propositions of the smaller size, although negotiations are still pending on at least one list of fair proportions. The trade still reports difficulty in closing pending inquiries, buyers deferring as long as possible the placing of definite orders. Competition continues extremely sharp in all lines of the machinery business. Special tool makers are more actively engaged, as a rule, than builders of the usual standard types of metal working equipment. A few inquiries have recently come from some of the local railroads, principally for single tools. The railroad demand continues very unsatisfactory, however, and does not show any sign of immediate betterment. Buying is light and scattered among a large variety of second-hand wood and metal working equipment. The call for castings for machinery parts has been comparatively quiet; in some instances steel casting plants have received a better run of orders, although the major portion of the work has been in the nature of locomotive castings. Gray iron foundries still report business of an irregular nature. The market for engines and boilers does not show any material improvement; considerable business is pending, principally in equipment of the medium and smaller horsepowers, but closes slowly.

Proposals are being taken by the Hess-Bright Mfg. Company for the erection of a new plant on the site recently acquired by it at Front street and Erie avenue. Plans were prepared by Dodge, Day & Zimmerman, comprising a two-story building 38 x 200 ft., of slow burning mill construction, which will be occupied by the office, inspection, testing and shipping departments and a steel frame building 200 x 220 ft., with saw tooth roof, for general manufacturing purposes.

The Philadelphia & Reading Railway has had inquiries before the trade for a heavy duty crank shaper and a 36-in. lathe. It is reported that the company's shops at Reading, Pa., have a somewhat better volume of business ahead.

The New Jersey Wire Cloth Company, Trenton, N. J., has moved a portion of its manufacturing department to Roebling, N. J., where buildings for its accommodation have recently been completed. Owing to the lack of available land for extensions at the Trenton plant, the increased demand for its product has and will continue to be taken care of at the new plant, where constant improvements are being made. The removal of a portion of its plant at this time was for the purpose of the concentration of its various departments. Some departments will continue to be operated at Trenton, which may or may not be ultimately removed to the Roebling works.

Current reports that the Otto Gas Engine Works was having plans prepared for a new plant, to be erected at Mt. Holly, N. J., are erroneous. Tentative plans are being prepared by local engineers for a proposed plant for the Otto Sales Company, which is considering the purchase of the automobile manufacturing department of the Otto Gas Engine Works, and, in view of such purchase being consummated, would erect a plant for the manufacture of the automobiles. At the time the Otto Sales Company acts as the selling agents for the Otto Automobiles.

The Nelson Valve Company reports the receipt of a larger number of small orders, which aggregate a better total than that in August or September and considers the outlook for business as being improved.

The Department of Wharves, Docks and Ferries, Joseph F. Haskarl, Director, will take bids until November 1, for furnishing electrical equipment for Vine Street Pier and Immigrant Quarters, for which $5500 is available. Specifications may be had at the office of the Director, 565 Bourse Building, this city.

The Philadelphia Textile Machinery Company has purchased a tract of land of about 8½ acres at Tabor

THE MACHINERY MARKETS

Road on the North Penn Branch of the Philadelphia & Reading Railroad. The purchase was made, not with a view of building a new plant at this time, but rather with the idea of being prepared for any future extensions.

The Root Dairy Supply Company, West Grove, Pa., will remove its manufacturing plant to Chester, Pa. Plans for the new plant are in course of preparation although the actual removal will not be made until next June or July.

The Light Mfg. Company, Pottstown, Pa., notes a somewhat better demand for its product and from present indications looks forward to much more active conditions. This concern has given considerable attention recently to the placing of its machinery and tool equipment in first class shape, so as to be better enabled to take care of prospective business.

The Cigar Machine Corporation of America, 205 West Lombard street, Baltimore, Md., will build a new plant at Curtis Bay, that city, which is to be one story, 300x300 ft., for the manufacture of automatic cigar making machines. The company is at present having its machines made at Providence, R. I.

Chicago

CHICAGO, ILL., October 24, 1911.

Machinery dealers in this market are finding a great deal of effort necessary in bringing such inquiries as are current to a focus, and a disposition on the part of machine shop operators to make the old machine serve a little longer is being manifested. Very few purchases are made without some trade deal being involved. At the same time some dealers report a scarcity of second hand machinery available for resale. For the most part recent inquiries of importance in this market are still unplaced. The Illinois Central Railroad purchased a large pipe machine and a 52-in. boring mill was sold to one of the plants of the International Harvester Company. The bulk of the business taken during the past ten days has been made up of sales of machines from the floor. A wide variety of tools has been in demand, but inquiries are generally for one or two machines only. Currency is being given to a report that the recent large lists for the Chicago & Alton Railway will not be placed this year. An inquiry for about $5000 in machinery from a local manufacturer is noted. The Laclede Steel Company, St. Louis, Mo., has ordered for its new steel plant machinery to the amount of several thousand dollars.

The Klemm Company, 1364 Grand avenue, Chicago, will build a one-story factory at that address to cost $1800. The architect is T. J. Raynerson.

The Triumph Bed Spring Company, Chicago, has been incorporated by Oscar Rehe, Frank Smith and Albert C. Benson, with a capital stock of $5000.

The Central Fire Sprinkler Company, Chicago, has been incorporated with $10,000 capital stock to manufacture and deal in automatic water sprinklers. The incorporators are A. J. Parker, F. M. Peterson and M. Summers.

The plant formerly occupied by the Webster Mfg. Company, on West Fifteenth street, Chicago, and recently sold to the W. S. Cuyler Wire Works, Cleveland, Ohio, was damaged by fire recently to the amount of $125,000. The greater portion of this damage was suffered by the Standard Mfg. Company, which was occupying one of the buildings, in losses on its machinery.

The Ideal Stencil Machine Company, Belleville, Ill., has been incorporated to manufacture stencil machinery. Geo. Remnsider is president and J. W. Marsh secretary and treasurer. The company has an authorized capital stock of $50,000.

The Mendota Mfg. & Transfer Company, Mendota, Ill., is constructing a plant to include a machine shop, blacksmith shop, general factory building and boiler room.

The Yale Mfg. & Sales Company, Milwaukee, Wis., has purchased the plantof the Oostburg Steel Foundry Company, which it will convert into a plant for the manufacture of metal novelties.

The Milwaukee Concrete Mixer & Machine Company, Milwaukee, Wis., is contemplating the erection of a $5,000 plant. Business growth has made this expansion necessary and a suitable site is now being sought.

H. M. Odgen, Milwaukee, Wis., is taking bids through Architect Schmetzky for a four-story brick factory 50 x 150 ft., to be built on Fourth street.

Henry J. Nelson, Green Bay, Wis., has purchased the building and machinery of the Dean Mfg. Company at Seymour and will move the machinery to Green Bay for the equipment of a machine shop.

The plant of the Hartman Trunk Company, Racine, Wis., was damaged recently by fire, with a loss of $85,000. Temporary arrangements have been made for the conduct of the business and new fireproof buildings will replace those destroyed as soon as possible.

The Wisconsin Iron & Wire Works, Milwaukee, Wis., is remodeling a part of its plant at a cost of $3000.

The Cream City Foundry Company, Milwaukee, Wis., is planning the erection of an addition to its plant at Fifteenth and Oklahoma avenues. A part of the addition will be built this fall and the remainder in the spring.

At Donnellson, Iowa, it has been decided to expend the sum of $8,500 for installing a water works system.

The Cownie Tanning Company, Des Moines, Iowa, C. R. Cownie, president, is planning the expenditure of $20,000 in the improvement of its plant. A large part of the outlay will be for new machinery.

At Sioux Falls, S. D., a bond issue of $300,000 was voted to provide for the installation of additional water works and sewerage.

Cleveland

CLEVELAND, OHIO, October 24, 1911.

The improved demand for machine tools noted in the previous two weeks has not been maintained. Following quite a spurt in buying the market is again quiet, both sales and inquiries being light. About the only business that came out during the week was a small volume of single tool orders. The demand for second hand machine tools is also inactive. Local machine tool builders continue to operate their plants at a productive capacity that in most cases is greater than their volume of business and some have accumulated good sized stocks. Makers of handling machinery report a good demand for hoists and other small equipment, but there is little demand for heavy handling machinery. Locomotive cranes, however, continue to move fairly well.

The manufacturing situation in general in this territory in metal working lines shows little change. The demand for a large share of the numerous small products that are of general everyday use is nearly normal. The automobile industry is regarded in a very satisfactory condition. Makers are not showing concern over the future and hesitancy about turning out cars in advance of sales that they were at this time last year. Some of the local automobile plants are being run full at double turn. Makers of automobile parts and accessories are generally busy.

The Metal Trades Superintendents' and Foremen's Club of Cleveland, on October 21, resumed its regular monthly meetings, which were discontinued during the summer months. A talk on the screw machine and its products was given by Emmet Leckner, foreman of the Chandler & Price Company, Cleveland. A general discussion of the subject followed. The opening meeting was in the nature of a smoker and refreshments were served. At the November meeting, James H. Herron, consulting engineer, Cleveland, will give a talk on Heat Treating of Steel.

The new plant of the Ironton Punch & Sheet Works, Ironton, Ohio, is nearing completion. It includes the plants of the Olive Foundry Company, Ironton, and of the Cincinnati Punch & Shear Works. In addition to the line of machinery formerly made by the latter company, the new plant will manufacture power metal working machinery. The new main building is 100 x 264 ft. The machine shop, foundry, forging room and other buildings have been remodeled and considerable new equipment has been added.

The Cleveland Pneumatic Tool Company, Cleveland, will shortly begin the erection of a building 50 x 50 ft. to be used as a stock room. This will permit the removal of the stock room from the present plant and provide additional room for manufacturing purposes.

The Burke Valve Company, Cleveland, recently incorporated with a capital stock of $50,000, was organized to place on the market a new motor tire valve. The company will not establish a plant, having arranged with a Cleveland manufacturing plant for making its valves.

The Electric Lap Welding Company, Cleveland, has been incorporated with a capital stock of $50,000 by George H. Tyler, George W. Boesel, H. G. Stacey, W. E. Gray, R. F. Nailler and H. C. Johnson.

The Packard Electric Company, Warren, Ohio, has increased its capital stock from $50,000 to $100,000 and

THE MACHINERY MARKETS

has a number of improvements and expansions in view. The erection of a frame and brick building, 24 x 30 ft., in which to make insulating varnish, will be started shortly. The company is planning to build a large brick and steel factory building next spring. This will be used for the manufacture of insulation cable, insulated cloth, transformers and other products.

The Goodyear Tire & Rubber Company, Akron, Ohio, has awarded a contract to the Hunkin-Conkey Construction Company, Cleveland, for an addition to its plant. It will be a two-story brick building, 30 x 120 ft.

The Ohio Pottery Company, Zanesville, Ohio, will build a new plant to replace one that was burned a few weeks ago.

The Standard Structural Company, Cleveland, has been incorporated with a capital stock of $10,000 by P. H. Anthony, Mark A. Copeland, G. B. Kennerdell, Joseph A. Schlitz and W. S. Mitchell.

The Martin Adjustable Piano Bench Company, Cleveland, has been incorporated with a capital stock of $15,000 by C. H. Martin, F. A. Brodbeck, Jr., S. G. Taylor and H. M. Farnsworth.

The Columbus Wire & Iron Works Company, Columbus, Ohio, will enlarge its plant by the erection of a two-story addition, 43 x 110 ft.

The John W. Brown Mfg. Company, Columbus, Ohio, is having plans prepared for a three-story addition to its plant, 27 x 70 ft. The company makes automobile and carriage lamps.

The Riley Shoe Mfg. Company, Columbus, Ohio, has had plans prepared for a large addition to its plant, but will delay letting contracts for the extension until next spring.

The Canton Corrugating Company, Canton, Ohio, has been incorporated with a capital stock of $100,000 by H. L. Riley and others.

The Robinson & Albright Company, Marysville, Ohio, will shortly begin the erection of a new packing plant.

The Standard Churn Company, Wapokoneta, Ohio, has been incorporated with a capital stock of $60,000 by F. H. Heman and others.

Cincinnati

CINCINNATI, OHIO, October 24, 1911.

While inquiries for machine tools are coming in freely they are slow developing into real orders. There is a continued absence of buying on the part of the railroads, automobile manufacturers and other large users of tools, and there is no indication that this particular class of the trade will come into the market any time soon, except for single machines.

Second-hand machinery dealers generally report business as being quite dull, although second-hand power equipment is in fair demand. The foundries report a slight improvement, and they are now operating to about 60 per cent of capacity.

The Cincinnati Branch, National Metal Trades Association, held a meeting on the evening of October 18, at the new Ohio Mechanics' Institute and discussed fully means for promoting the interests of shop apprentices. A special committee was appointed to investigate conditions, and will make a report at a future meeting.

The Pioneer Motor Car Company, Marietta, Ohio, newly incorporated, has had plans prepared for a modern three-story garage that will be 58x190 ft., and of reinforced concrete construction. Some equipment for the repair shop will be required. H. B. Coen is named as one of the principal incorporators.

It is reported that the Ault & Wiborg Company, Cincinnati, will soon erect a large addition to its varnish plant on Northern avenue.

Hilb & Baur, Cincinnati, scrap iron merchants and second-hand machinery dealers, confirm the report that they will soon make a large addition to their building in the western part of the city.

The Ohio Products Company is a new Cincinnati incorporation with $60,000 capital stock. It is the announced purpose of the new company to build a large distilling plant at some point in the South for the purpose of extracting wood alcohol, turpentine, &c., from waste sawmill products. G. B. Groesbeck is one of the principal incorporators.

The Foos Gas Engine Company, Springfield, Ohio, has authorized Architect R. C. Gotwald to draw up plans for the large addition to its plant, previously mentioned. The new structure will be about 95x295 ft., one story.

The new factory of the Union Thread Company in Carthage, a Cincinnati suburb, is nearly completed, and the work of installing the necessary equipment will be commenced at an early date.

The Bauroth Machine Company, Toledo, Ohio, has changed its name to the Bauroth Machine & Stamping Company.

The Norwalk Motor Car Company, Martinsburg, W. Va., has been incorporated with $300,000 capital stock, by F. A. Minor, S. P. Hopkins and others. No manufacturing plans have yet been given out.

F. A. Kemlein, secretary, the Builders' Exchange, Dayton, Ohio, reports very satisfactory progress being made on the large five-story concrete building now being constructed in Edgemont suburb for the Ohmer Fare Register Company. The McCormick Building on First street and the Bimm power building and warehouse are two structures now under way that will be used for light manufacturing purposes when completed.

The Ventilating Sash Lock Company, Princeton, W. Va., has been incorporated with $15,000 capital stock to manufacture sash locks. J. W. Thorn and B. S. Peter are among the principal incorporators.

It is reported that the American Steel Package Company, Defiance, Ohio, contemplates making an addition to its plant.

The Leabarjan Mfg. Company, Hamilton, Ohio, is building a factory to manufacture the Leabarjan patented music punch. The company will not only be in the market soon for special light machinery and jigs, but will require some power equipment. John C. Lease of Hamilton is understood to be the head of the new company.

Architect G. W. Drach, Union Trust Building, Cincinnati, has completed plans for the addition to the power plant of the Central Mfg. Company at Lockland, Ohio, recently mentioned.

Detroit

DETROIT, MICH., October 24, 1911.

Satisfactory conditions prevail in most branches of the local machinery market. Numerous inquiries continue to come in and dealers report a considerable volume of sales of single tools and small lots. Electrical equipment in the smaller units is selling well. Saw mill machinery continues in demand. Considerable business in small shop equipment is being transacted and the demand for machinists' small tools is very brisk indeed. Manufacturers of tools are being kept fairly busy but their activity varies according to the nature of tools built. Little second-hand machinery is moving, although inquiries for this class of equipment are fairly good. Little municipal work of direct interest to the trade is being done, some minor improvements to electric light plants being the extent of this business. Considerable new construction work is in view, in spite of the approach of winter, including a number of factory additions.

Ground has been broken for the erection of a new manufacturing building for the Hudson Motor Car Company, adjoining its present plant. The new building is of steel and concrete construction, two stories and 60 x 530 ft. A large amount of new equipment will have to be purchased.

The Acme Heater Company, manufacturer of electric stoves and specialities, is building a new factory at Scotten and Michigan avenues.

The Detroit Insulated Wire Company is increasing its capacity by the erection of a new factory building of three stories.

The Pingree Shoe Company is completing a large two-story addition to its present plant on Jefferson avenue, and is reported to be in the market for considerable shoe manufacturing machinery. The company recently increased its capital stock.

The village of River Rouge, Mich., is making improvements to its electric light plant, and will probably purchase a new generator in the near future.

The Public Lighting Commission has taken out a permit for the construction of a five-story shop building adjoining the present electric light plant. Details as to the equipment to be installed have not as yet been announced.

The Michigan Stamping Company has been incorporated with a capital stock of $10,000. J. H. French, H. P. Cope and J. T. Murray are the principal stockholders.

The Detroit Wood Pulley Company has been incorporated with a capital stock of $12,500. Daniel W. Avery is the principal stockholder.

THE MACHINERY MARKETS

Jordan & Steele, Hastings, Mich., manufacturers of sink frames, will merge their business into a stock company and enlarge their plant.

The Escanaba Pulp & Paper Company, Escanaba, Mich., has been incorporated with a capital stock of $30,000, and will engage in the manufacture of paper.

The Berkey & Gas Furniture Company and the Oriel Cabinet Company, both of Grand Rapids, Mich., have completed a merger of their businesses and the capital stock of the new company will be $1,000,000.

The Pere Marquette Railroad Company has awarded contracts for the construction of a woodworking shop at Saginaw, Mich. The new building will be two stories 80 x 150 ft. and will cost $8,000 exclusive of the mechanical equipment.

The Cummer-Diggins Lumber Company, Cadillac, Mich., is contemplating the erection of a shingle mill in the near future. The company has just completed a $20,000 addition to its plant.

The plant of the J. B. Armstrong Mfg. Company, Flint, Mich., maker of automobile axles, has been sold to the Western Spring & Axle Company, Cincinnati. No additions to the plant are contemplated at present.

A company with $25,000 capital stock has been organized at Monroe, Mich., to take over the business of the Elkhart Mfg. Company, Elkhart, Ind., and the plant will be moved to Monroe where large manufacturing quarters have been secured. H. S. Hubbard is president of the new company. Magnetos are to be manufactured.

A foundry and machine shop is being established at Sault Ste. Marie, Mich., by B. W. Prentice.

Williams Bros., Cadillac, Mich., are making extensive additions to their saw mill plant in that city, including the installation of considerable new machinery.

The Central Station Engineering Company of Chicago has asked the city of Kalamazoo, Mich., for a franchise to construct and operate a central heating plant. It is considered probable that the franchise will be granted.

The Standard Foundry & Mfg. Company has been organized at Alma, Mich., to engage in the foundry business and the manufacture of shop machinery. A factory building 65 x 45 will be erected.

Improvements are being made at the Lakeside Iron Works, Marquette, Mich., which will greatly increase the company's facilities. Considerable air and electric machinery is being installed.

The Michigan Auto Joint Company has organized at Grand Rapids, Mich., to manufacture universal joints and automobile accessories. The capital stock is $10,000 and stockholders include C. E. Perkins and F. Carter.

A pipe organ factory is to be built at South Haven, Mich., as a branch to the plant of Cosavant Bros., St. Hyacinth, Que. Plans are now being drawn and it is the intention to have the building completed early in 1912.

The Miller Car Company, Detroit, has taken out a permit for the construction of a one-story brick factory on Richmond avenue in that city to cost $5,000.

The Eastern Michigan Edison Company will begin at once the construction of a power plant on the Huron river at Ann Arbor, Mich. The new plant will involve the expenditure of $250,000 and will develop 800 hp. Power will be furnished to Ann Arbor, Ypsilanti and neighboring towns. Gardner S. Williams is the architect in charge.

The Engineering Products Company, Detroit, manufacturer of electrical specialties, has moved into its new plant, a one-story building 80 x 115 ft. on Goldsmith avenue near the Michigan Central Railroad tracks. The company is in the market for the following machine tools: two lathes, one 12 and one 20 in.; two drill presses, one 18 and one 24 in.; one milling machine; one planer; one power hacksaw; one 5 hp. 3-phase induction motor, 220 volts, together with small tools and supplies.

Indianapolis

INDIANAPOLIS, IND., October 24, 1911.

The Indiana Gas Engine Company, with $25,000 capital stock, has been incorporated at Indianapolis by G. G. Westerfield, I. W. Connally and C. A. Korbly. It will manufacture gas engines of a new type.

The Wasmuth-Endicott Company, Huntington, Ind., has been incorporated with $20,000 capital stock to manufacture kitchen furniture. The directors are E. M., D. A., A. D., F. L., H. R. Wasmuth, H. A. Dinius and C. E. Endicott.

The Sterling Furniture Company, Indianapolis, has been incorporated with $20,000 capital stock to manufacture furniture. The directors are E. W. Bassett, F. B. Moreland and B. Denny.

The Central Gas & Power Company, Evansville, Ind., has been incorporated with $100,000 capital stock to distribute electrical energy. The directors are P. J. Scheller, H. Dannettell and H. J. Peckinpaugh.

The Bliss Sanitary Garbage Can Company has been organized at Grabill, Ind., with $40,000 capital stock to manufacture tin and metal articles. The directors are J. Witmer, B. B. Schlatter and A. Egly.

The Bedford Stone Company, Bedford, Ind., has been incorporated with $20,000 capital stock to quarry and manufacture stone. The directors are F. E. Allen, G. W. Tarleton and W. F. Brooks.

The Campfield Raggle Block Company, Richmond, Ind., has increased its capital stock from $1000 to $10,000.

The Crane Company, Chicago, dealer in heating and plumbing supplies, has let the contract to the William P. Jungclaus Company, of Indianapolis, for a fireproof office and warehouse in Indianapolis. The contract price is $80,000.

The Decatur Motorcar Company, Decatur, Ind., has increased its capital stock from $200,000 to $350,000.

The Central Indiana Water, Light, Heat & Power Company has been incorporated at Francesville, Ind., with $125,000 capital stock, to supply Francesville and other towns. The directors are E. A. Rossiter, Hazel Keenon, Edward Smalley, Chas. Lohrer and A. J. Cooper.

The American Playground Device & Swing Company, Terre Haute, Ind., has been incorporated with $10,000 capital stock to manufacture gymnasium and playground equipment. The directors are W. H. Freeman, G. W. Kreitenstein and O. T. Fries.

The Farmers Peat Fuel Company, Indianapolis, has been incorporated with $75,000 capital stock to manufacture peat pressing machinery. The directors are R. S. Lawrence, P. A. Lavallee and C. B. Marshall.

The Peru Basket Company has been incorporated at Peru, Ind., with $30,000 capital stock to manufacture baskets. The directors are G. R. Chamberlin, A. H. Chamberlin and T. A. Keyes.

The Laporte Radiator Company, Laporte, Ind., has been incorporated with $100,000 capital stock to manufacture radiators. The directors are A. J. Rumely, Emmet Scott and V. P. Wilkins.

The South

LOUISVILLE, KY., October 24, 1911.

The passage of the week in machinery circles has brought about the usual degree of improvement which is looked for at this season of the year, and which, fortunately for everybody concerned, has not been in the least lacking at any stage of the fall of 1911 to date. The demand for all sorts of equipment is steadily improving and the dealers scout the idea of a dull period breaking until it absolutely becomes so cold in the land of cotton that there is no chance for factory improvement or equipment installation to proceed. It is generally agreed that a month or possibly six weeks of brisk activity is ahead of the machinery makers and dealers.

It developed last week that the Louisville Lighting Company, in this city, reorganized by the election of a new president, Brig. Gen. John Harries, vice Fred M. Sackett, resigned, is contemplating putting in a strong bid for the municipal franchise that is to be awarded by the General Council for the erection and maintenance of a big central steam heating station in the Gateway City. This means that the Kentucky Electric Company will have a strong competitor for the privilege of furnishing steam heating service to the public, and it is a matter of question as to whether the Louisville or the Kentucky company will ultimately erect the heating plant.

The American Automobile Mfg. Company, New Albany, Ind., directly across the Ohio River from Louisville, held a meeting of its directors last week and elected George H. Wilson, a well-known manufacturer of Louisville, president of the company. The company, in addition to continuing the manufacture of its Jonz two-cycle motor car upon an extended scale, will make a four-cycle machine in the near future and is planning the production of commercial cars as well as pleasure vehicles. While no new automobile manufacturing equipment will be required by the extension

THE MACHINERY MARKETS

just at present, improvements will undoubtedly be necessitated in the plant in the near future.

The Brush Creek Coal & Mfg. Company is equipping a mine near Barbourville, Ky., and expects to be shipping by January. 1 A lot of the mining apparatus is yet to be secured and installed. The Gibson-Carr Company, of Middlesboro, Ky., is also preparing to operate a big mine in the Barbourville district, to be ready for business about January 1.

The new Louisville Bolt & Iron Company, formed to operate a big sheet steel manufacturing plant in Louisville, Ky., filed articles of incorporation at Indianapolis, Ind., last week, placing its capital stock at $400,000. The corporate name of the company is the Louisville Steel & Iron Company and the central offices will be located in Indianapolis, although the plant, which is capable of handling $1,000,000 worth of business a year, is located in South Louisville. George H. Holzbog, a Jeffersonville, Ind., capitalist, is promoting the organization of the company, and the following directors have been elected: Walter T. Verigan, Elias D. Salsbury, Randolph T. Wedding, Lawrence A. Wiles and Ernest M. Sherburne.

The municipal authorities of Corbin, Ky., according to a recent announcement, are considering the construction of a good-sized water-works.

The city authorities at Cadiz, Ky., have decided to offer a municipal franchise for the operation of an electric light plant for sale. The proposed plant will be equipped with turbines, as the power is to be generated by water. A. C. Burnett, secretary of the Cadiz Commercial Club, is promoting the formation of the public service corporation.

A proposed bond issue having been recently defeated in Maryville, Tenn., the city authorities of that place, headed by Mayor A. K. Harper, are contemplating the award of franchise privileges for corporations which wish to construct water-works and sewerage systems in Maryville.

The Mayor of Waverly, Tenn., recently secured a vote of the Council of that city favoring the purchase of a water-works and electric lighting plant from the Lucas Land & Lumber Company, Waverly. The new acquisition of the Waverly officials is to be enlarged and extended to accommodate city-wide demand for water and lighting.

Jasper Bowens is promoting the organization of a company to erect and maintain an electric lighting and power plant at Whitesburg, Ky.

The municipal authorities of Decatur, Ala., have decided to erect a $50,000 electric lighting and power plant and are now drawing plans for the institution.

The Mayor of Auburndale, Fla., is having plans drawn for the establishment of an up-to-date electric plant in Auburndale.

H. L. Milner has secured a franchise from the city authorities of Morgantown, N. C., and is now starting work upon a big electric light and power plant.

The Howe Ice Company, Nashville, Tenn., of which Harry Howe is president, has completed plans for the erection of a branch ice plant in Atlanta, Ga., and is planning to increase the capacity of its plant in Nashville 100 tons per day.

The Asbury Marble Company filed articles of incorporation with $25,000 capital stock at Knoxville, Tenn., last week and will engage in a general quarrying business in the Knoxville marble fields, installing a complete array of quarrying equipment. The incorporators of the new company are James B. Jones, Arthur Burkhardt and others.

William G. Cummins, Pittsburgh, Pa., is now in Nashville, Tenn., planning the establishment of a factory to make water-works fittings. A suitable structure for the work will be secured and equipped as soon as possible and a full line of hydrants, faucets and valves will be produced.

The Paxton Lumber Company, Bristol, Tenn., will erect a large planing mill and operate it in connection with the Paxton woodworking plant in Bristol as soon as possible.

J. C. Bilbry is figuring upon the equipment and operation of a manufactory for vehicle hubs and spokes in Carthage, Tenn., in the near future.

The Central Lumber Company, Chattanooga, Tenn., is planning the establishment of a complete woodworking plant for the manufacture of poplar, oak and chestnut lumber, cross-arms, etc., and will also engage in a machinery and mill supply business. The capacity of the Central woodworking plant is to be in the neighborhood of 35,000 ft. of lumber per day.

T. B. Felder and others, Atlanta, Ga., have incorporated the Shaw Kiln Company with a capital stock of $500,000 and are now planning the establishment of a brick and tile manufacturing plant of large capacity.

The Surrey Chair Company, Elkin, N. C., has been formed to establish a chair factory. Equipment for the plant is yet to be secured.

The Dean Mfg. Company, Newport, Ky., is preparing to enlarge its plant and will provide increased capacity to accommodate growing business. The company is now manufacturing all sorts of gasoline engines for motor boats, and automobiles, and proposes to equip a department for the manufacture of aeroplane engines.

The Muhlenberg Sentinel Publishing Company, publishing one of the leading papers in the Greenville, Ky., district, is planning to rebuild and install a lot of new machinery in its printing plant, which was burned a short time ago.

The Kaul Lumber Company, Tuscaloosa, Ala., is planning the erection of a plant, the cost of equipping which will be in the neighborhood of $300,000.

The Calloway Engine & Improvement Company, Jonesboro, La., has been incorporated to manufacture a turbine engine under the patents of G. E. Calloway. The incorporators are G. W. Sadler, A. C. Thomas, B. F. Blumdell and others.

The Galey Lock Nut Company, Jackson, Tenn., has been organized with a capital stock of $100,000 to manufacture and market a patented lock nut. The officers of the company are W. F. Lamb, president; G. D. Seiler, secretary and treasurer.

The town of Amory, Miss., will receive bids until November 7 for furnishing material and constructing water works and sewers, which include one 100,000-gal. tank, two 500-gal. per minute motor driven pumps, one air lift system and approximately five miles of mains, hydrants, valves, etc. The Solomon Norcross Company, Atlanta, Ga., is the engineer in charge.

The Southern Mfg. Company, Gadsden, Ala., whose plant was recently burned, has had plans prepared and is investigating sites for the erection of a new plant. The company will be in the market for power and equipment for a planing mill and sash and blind factory which will employ about 100 men.

St. Louis

ST. LOUIS, MO., October 21, 1911.

The conditions in the machine tool market show the same tendency toward improvement that was indicated last week, but as then the developments are of the individual order rather than in big lists from large establishments. The aggregate, however, in comparison with past conditions is very satisfactory. The inquiry for second-hand tools in good condition continues to improve.

The Plantation Equipment Company was incorporated in St. Louis the past week by William C. Zelle, William G. Brenneke, Henry C. Zelle, Charles E. Zelle, Arthur A. Zelle and Conway Elder, with $100,000 authorized capital stock. The company will manufacture gasoline propelled agricultural machinery and implements. While its own plant is being built and equipped its product will be turned out on contract by a machine shop at Belleville, Ill.

The Miller Machine Company, Bridgeport, Ill., has been incorporated with $6,000 capital stock and will equip a plant at once. The incorporators are George D. Miller, L. Miller and R. D. Donnelly.

The John G. Massie Mfg. Company, with $50,000 capital stock, has been incorporated by John G. Massie, Leon G. Smith and Frank D. Wyant. A plant will be equipped at once.

The Fisher-Hicklin Mfg. Company, Sweet Springs, Mo., has been incorporated with $40,000 capital stock by Charles and Edward Fisher and John Hicklin.

The Minor-Graham Lead & Zinc Company, Joplin, Mo., has been incorporated with $30,000 capital stock by John F. Minor, W. P. Graham, W. P. Fulkerson. It will put in a mining equipment.

The C. W. Haas Tire Seat Company has been incorporated at Peoria, Ill., with $75,000 capital stock for the manufacture of tires for automobiles, accessories, etc. The incorporators are C. W. Haas, Richard C. Uckena and Emmet C. May.

The Imperial Clock Company, which recently incorporated in Missouri and established a large new plant in St. Louis, has been prevented by injunction from removing the machinery of its original small plant from Granite City, Ill. A minority of the stockholders of the original company are fighting the extension of the company.

THE MACHINERY MARKETS

The Dorris Motor Car Company, of St. Louis, has taken out the city permit for the construction of the first unit (to cost $68,000) of its new addition for the manufacture of automobiles.

The American Furnace Company, St. Louis, has taken out a permit for the construction of a new factory building, to cost $16,000, exclusive of mechanical equipment.

The Dalton Adding Machine Company, Poplar Bluff, Mo., has leased quarters in St. Louis for a branch factory and distributing station.

The Union Pacific Railroad round house at Sidney, Neb., was destroyed by fire recently with an estimated loss of $250,000.

The Missouri Pacific Railroad is reported as planning the erection of car shops at Fort Scott, Kan.

The Mutual Ice & Cold Storage Company, Topeka, Kan., is planning the expenditure of $50,000 for improvements and additions to its plant.

At Ponca City, Okla., the question of issuing bonds to the amount of $30,000 to build an electric light plant is under consideration.

Texas

AUSTIN, TEX., October 21, 1911.

A noticeable feature of the machinery trade at this time is the increase in the demand for mining equipment in Arizona, New Mexico and Mexico. In Texas many industrial plants are being promoted. The mildness of the winter climate all through Texas makes it possible for industrial projects to be carried on without interruption throughout the year, and in fact most of the work of this character is done during the winter season when labor is more abundant.

The Kenedy Light & Power Company is installing an electric light plant at Kenedy. The plant will be so arranged that its capacity may be easily increased when the demand becomes larger.

The Standard Water Meter Company has been formed at Dallas with a capital stock of $10,000. The incorporators are G. K. Garrison, C. A. Chase and T. P. Roberts.

The Business Men's Club is promoting the establishment at Plainview of a beet sugar factory to cost $600,000. Sugar manufacturers of Chippewa Falls, Wis., are interested in the proposed enterprise.

The Cleburne Motor Car Mfg. Company has been formed to install a plant at Cleburne for the manufacture of automobiles. The erection of the factory will soon be started.

The Medina Irrigation Company, which is constructing a dam and irrigation system near San Antonio at a cost of about $6,000,000, will also erect large cotton mills and oil mills and other industrial plants to utilize the products grown upon the land that is to be reclaimed. The construction of an electric interurban railway to run from San Antonio through the irrigated property and intermediate towns will be started in a short time, it is stated.

A syndicate of Lowell, Mass., cotton mill men will establish a large cotton goods plant at San Benito. B. F. Yoakum of New York, chairman of the Frisco Railroad Board and Executive Committee, is associated with them in the project.

The city of Hamlin is installing additional machinery in its waterworks plant and making other improvements to the system.

Patricia Gonzales will establish a buggy and carriage factory at Berclair.

The Commercial Club of Temple is promoting the establishment there of a large iron foundry and machine shop. A. Alstadt is back of the project.

The Gonzales Bridge & Iron Company has begun the erection of its plant at Gonzales, which will be devoted to the manufacture of bridge material.

The American Sugar Mfg. & Refining Company which was recently formed will soon begin the erection of a large beet sugar factory at Portales, N. M. In connection with this enterprise it is probable that a railroad will be constructed through what is known as the shallow water belt where farmers will engage extensively in growing sugar beets.

The Chapala Hydroelectric & Irrigation Company of Guadalajara, Mexico, will soon complete the installation of its new hydroelectric plant at Puente Grande and will remodel and reconstruct its power transmission system that extends to the Hostotipaquillo and Etzatlan mining districts.

Deutz Brothers and associates will install a plant for the manufacture of machines for shredding the fiber of the maguey plant at San Luis Potosi, Mexico. A company has been formed under the name of the Compania Desfibradora Forseck, S. A., to erect and operate the proposed plant.

The Ray Central Mining Company will install a large mill and other machinery and make general improvements to its property situated at Ray, Ariz., at a cost of about $1,500,000, according to estimates made by the board of directors.

The Sunset Mining & Smelting Company of Cerrillos, N. M., will install a concentrator at its property at that place. Headquarters of the company are at Cerrillos.

The Mololoa Mining Company will install a reduction plant at its mine near Hostotipaquillo, State of Jalisco, Mexico. W. M. Matthews is general manager.

Edmund Putnam and associates will install an electric hoist and other machinery at the Providencia mine near Parral, Mexico.

The Live Oaks Copper Company will install a 150-ton mill at its property near Miami, Ariz.

The Douglas Copper Company will install churn drills upon its property near Ray, Ariz.

Emilio Arroyo of Parral and associates will install a large amount of machinery at their Europa mines near Parral, Mexico.

The Victoria Mining Company will install hydroelectric machinery at its placer mines near Greaterville, Ariz.

Chas. Ross will install a pump upon his Colossol mine at Fairview, N. M.

The Compania Explotadora y Exploradora will install hoisting machinery and make other improvements at its mines at Guanacevi, State of Durango, Mexico.

The Atlas Metal Works, Dallas, has had plans prepared for a factory building, 75 x 250 ft., which it will erect on a 35 acre site recently acquired. The company has not as yet prepared a list of the equipment needed.

The Pacific Coast

SAN FRANCISCO, CAL., October 17, 1911.

The machine tool market in California is without animation, though the aggregate volume of business is somewhat better than last month. The principal movement is on very small orders, with scarcely any inquiry from the larger interests, and local shops are keeping out of the market almost entirely. Very little is heard from shops in the oilfields, which purchased a good many tools early in the summer. The general outlook, however, is considered fair, with some indications of gradually increasing activity during the coming year.

Within the past year a large number of machine tools, and considerable other equipment, have been purchased for manual training schools in the Coast district, and some business of this nature is still in prospect. A very fair order has just been placed with Louis G. Henes, representing Manning, Maxwell & Moore and other manufacturers, for the complete equipment of forge, woodworking and machine shops of a school at Salt Lake City.

Several new orders have come out for electrical equipment, both for private enterprises and municipal lighting plants. The Great Western Power Company is starting active work on a large project at its Big Meadows site, which will call for considerable contractors' equipment, as well as electrical machinery. Waterworks equipment is an important factor, with prospects of increasing inquiries during the coming year. There is some inquiry for railroad supplies, rolling stock, etc., from logging interests, and with many extensions under way interurban traction companies will probably be in the market for similar supplies within the next few months. Rock crushing machinery is quiet, but the outlook is better than for some time past.

The Union Iron Works has taken out a building permit for its new shop building.

Contracts have been let for the Westinghouse Air Brake Company's buildings at Emeryville, Cal., and it is expected that some shop equipment will be installed, but so far there has been no definite inquiry.

The Howes Machinery Company, San Francisco, has been incorporated with a capital stock of $50,000, by H. A. Norman, W. E. and E. E. Howes, C. C. C. and A. G. Cunningham.

A large number of electric motors have recently

THE MACHINERY MARKETS

been sold to oil well operators in districts which are now being reached by power distribution lines.

The Cyclops Iron Works, now on Main street, manufacturer of brewing and refrigerating machinery, is preparing to put up a two-story brick building on Folsom street near Fourth.

Frederick C. Roberts & Co. have taken the contract for steam turbines, generators and switchboard in the San Francisco Hospital, at $23,198. The boiler contract was awarded to the Robert Dalziel, Jr., Company.

A lot of machinery is to be added shortly to the municipal pumping plant of Whittier, Cal.

It is reported that a pumping plant is to be installed at the Lakeview oil well, which for a time was the largest gusher ever opened in California.

The Capital Gas Engine Company, Sacramento, Cal., has been incorporated with a capital stock of $100,000, by James Shaw, F. F. Thompson, C. H. Hardy, A. F. Harrison and W. A. Mackinder. The company has taken over the Bell Machine Shop, which will probably be enlarged.

F. C. Holman is installing a machine shop at Sonora, Cal.

The Brown-Doane Company has announced its intention to install a sash and door factory at Red Bluff, Cal.

A report has been circulated that a malleable iron plant was to be established at San Bernardino, Cal. The plant under discussion is already in operation near Riverside, Cal., and it is announced that it will not be moved.

Negotiations are under way for the establishment of a new oil refinery by a Colorado concern in the vicinity of Los Angeles.

Plans are being drawn for a 100-ton concentrating plant for the Globe Western Company, Miami, Ariz.

H. G. Fenton, Escondido, Cal., has installed a rock crusher of 100 tons daily capacity.

Jas. Hewitt, Gibsonville, Cal., has purchased a five-stamp ore mill.

The Gorham Engineering Company has added a number of small tools to its gas engine plant in Oakland.

The Standard Oil Company is preparing to add a new unit to its large oil pumping plant near Martinez, Cal.

The Klamath Falls Iron Works, Klamath Falls, Ore., has purchased property adjoining its present location for the purpose of adding to its plant.

Eastern Canada

TORONTO, ONT., October 21, 1911.

The fine weather has been favorable to business. Outdoor operations that are often brought to a standstill at this season are keeping hosts of workers employed. House building, railway construction, the carrying out of large public works in cities, the linking up and extension of power transmission systems, the working of mines, etc., are now proceeding as energetically as they were a month ago. There is a very large absorbent demand. If there were not, the output of the now large manufacturing capacity of Canadian works producing machinery, etc., would speedily begin to accumulate, which it is by no means doing. Trade returns show that the importations of such plants are increasing. It is safe to say that no other country in the world of Canada's population is at the present time swallowing up a greater quantity of new equipment. The railways keep on adding to their mileage. Their total demand for equipment is now of large dimensions. There is some speculation as to the profitableness of business if trade in the United States continues to fall away throughout the twelvemonth that remains before the holding of the Presidential election. Buyers are understood to be looking forward to lower prices, and contracts for installations to be put in some months hence are said to be undertaken, in some cases, upon calculations that the plant can be bought at lower prices when time for placing it in position is near at hand.

The Dominion Casket Company proposes to buy the factory of the Canada Furniture Company in Guelph, Ont., and carry on business there.

Negotiations have begun for establishing at Niagara Falls, Ont., a branch of the Stotts Railway Signal Company. Also an American company manufacturing vacuum cleaners is considering the question of locating branch works there.

It is rumored that the Bayless Pulp & Paper Company, whose dam at Austin, Pa., broke with such frightful consequences about a fortnight ago, will move to Quebec.

The ratepayers of Alliston, Ont., have approved a by-law to grant municipal privileges to the Deffries Woodman Company, which will establish there a plant for the manufacture of silverware.

The factory the Brockville Auto Company is building at Brockville, Ont., is nearly ready for the installation of the machinery.

The Stone Mfg. Company is about to establish a factory at Ingersoll, Ont.

The Cossit Company, Brockville, Ont., has a two-story addition to its scale factory under way.

The Nova Scotia Power Company is preparing to begin construction work on its site on the Gaspereaux River.

Great progress is being made in the Porcupine camp of northern Ontario in the work of building the place up anew after the destructive effect of the fire of last spring. At the Dome mine the power house, the machine shop and accessory buildings are being put up. Steel for the mill and the cyanide plant are on the way. A new crusher has been bought and equipment for stamp mills are coming. In the mill 500 tons of steel will be used. The Dominion Bridge Company, Montreal, has the order for this.

The Clinton Motor Truck Company is proposing to establish a factory in Clinton, Ont., if certain municipal privileges are granted.

The Dominion Government has approved the plans of the Cedar Rapids Mfg. Company, Montreal, to carry out its great power improvement and industrial scheme on the St. Lawrence River.

P. W. Gardiner & Son, Galt, Ont., are adding a large extension to their factory.

The Merchants' Rubber Company, Berlin, Ont., is preparing to build a very large addition to its factory.

The Bishop Construction Company, Montreal and Toronto, has the contract to erect the buildings of the Canadian Yale & Towne, Ltd., St. Catharines, Ont.

The Town Council of Galt, Ont., is considering the installation of a plant for the pumping of the water supply by hydroelectric power.

The Montreal Board of Control has reported in favor of the tender of the W. E. Seagrave Company, Walkerville, Ont., for the supply of motor trucks for the fire protection service, the company's tender being $20,650. The $11,500 tender of the representative of the Waterous engines was also approved, two engines to be supplied.

Large extensions are being made at the works of the E. B. Eddy Company, Hull, Que.

The promoters of the Ontario Adjustable Hub & Wheel Company are making a proposal to Berlin, Ont., for the establishing of the plant there.

The machinery purchased in Europe by the chairman of the Ontario Hydro-Electric Power Commission for the purpose of demonstrating the uses of electricity on the farm and in the home has now reached Toronto.

The commissioners of the Trans-Continental Railway, Ottawa, will receive, up to November 8, tenders for the construction and erection of the following: Two 150-hp horizontal return tubular boilers at Napadogan, N. B.; two 150-hp horizontal return tubular boilers at Edmundston, N. B.; two 150-hp horizontal return tubular boilers at Cochrane, Ont.

F. N. Burt Company, Toronto, is erecting a factory to cost $30,000.

The Canadian Light & Power Company, Montreal, has purchased the Dominion Light, Heat & Power Company's interests.

The British Canadian Explosives Company will erect a factory on an extensive site it has just purchased in East Sherbrooke, Que.

The City Council of Ottawa has at last decided to close the contract for the installation of a Heenan-Froude incinerator for $34,650.

M. M. Tracey, Connecticut, has a proposal before the Council of Cookshire, Que., for the establishment of a large match factory there.

The McGeachy Dairy Company, Chatham, Ont., is building a new factory, for which it will require boiler, engine and latest dairy machinery and electric fittings.

The Delhi Canning Company, Delhi, Ont., is about to make an extension of its plant and will be installing new machinery.

The Burill Company, manufacturer of cream separators, Brockville, Ont., has just awarded a contract for the erection of an addition to its factory.

The Ford Motor Company is about to purchase equipment for its power department at Walkerville, Ont.

THE MACHINERY MARKETS

The W. C. Crawford Co., Tilbury, Ont., is building a factory there for the manufacture of handles and will be in the market for equipment.

The Dominion Wood & Lumber Company has under consideration a proposal to establish a chemical plant at Trout Creek, Ont., to cost $250,000. J. Kaufman, Berlin, Ont., is president.

The Bretton Automatic Scale Company is about to locate in Welland, Ont.

The Canadian Automatic Transportation Company, Toronto, requires lathes, drills, shapers and other machine shop appliances for its factory.

The Blockaders Lumber Mills, near Weymouth, N. S., was totally destroyed by fire recently. The mill will be rebuilt and machinery for its equipment will be required.

The Auto Top Company is erecting a large factory in Walkerville, Ont., for which equipment will be required.

The E. M. F. Company, Walkerville, Ontario, is spending $70,000 upon an addition to its factory. Machinery will be required.

The Russell Motor Car Company, Toronto, is making an extensive addition to its plant in North Toronto.

The Imperial Oil Company has plans in preparation for extensive additions to be made to its refining plant at Sarnia, Ont.

Steam & Radiation, Ltd., manufacturer of radiators and boilers, have completed plans for a foundry building, 120x240 ft., and a machine shop, 200x200 ft., to be erected at St. Catharine's, Ont.

Western Canada

WINNIPEG, MAN., October 21, 1911.

E. W. Bachus, president of the Ontario & Minnesota Power Company, stated a few days ago that inside of a year he would have a large paper and pulp mill at Fort Frances, West Ontario, to use the Canadian share of the power. The town has been urging this for some time.

The Brandon Creamery Company, Brandon, Manitoba, is enlarging its plant and is adding a new cold storage.

The Standard Patent Candle Company, Cape Town, South Africa, is negotiating in connection with establishing a factory at Vancouver, B. C.

It is announced that the Manitoba Glass Works, at Beausejour, Man., will increase the capacity of its plant.

The citizens of Prince Rupert, B. C., have carried by-laws providing for an expenditure of not more than $500,000 on waterworks and electric light system.

The Fort George Timber & Trading Company is considering the installation of an electric plant to supply light and power for the town of South Fort George, B. C.

The ratepayers of Edmonton, Alberta, have voted approval of the establishment of a municipal gas plant.

Plans are being prepared for a filtration plant for the city of Saskatoon, Sask.

New shops and yards are to be built by the Canadian Pacific Railroad Company at Coquitlam, B. C.

A company that is now making motor trucks at Warren, Ohio, is said to be considering the idea of establishing a plant at Port Arthur, Ont.

It is the estimate of Sir Donald Mann that the projected enlargement of the blast furnaces at Port Arthur and the addition of a foundry, etc., will cost between $3,000,000 and $4,000,000.

According to the Evening Chronicle of Port Arthur, Ont., the construction of the C. P. R. terminals on Island No. 1 will mean an expenditure of $10,000,000.

The Western Dry Dock & Shipbuilding Company has its plant at Fort William, Ont., nearly ready for operations. Upwards of 300 men are now employed upon it. The plant will be ready to undertake repairs of any kind and to build ships. Next year there will be important extensions.

The Crown Timber & Trading Company, Vancouver, B. C., proposes to build and operate a large sawmill at Millside, near New Westminster, B. C.

It is announced by the French Complex Ore Reduction Company that it will erect a zinc smelter at Nelson, B. C., and also plants to turn to account black manganese oxide.

The Powell River Paper Company at Powell River, B. C., is now ready to operate its new 80-ton paper mill there.

It is stated that $2,000,000 of British capital is about to be applied to the work of extending the business of E. H. Heaps & Co., lumber manufacturers. Besides adding to the sawmill capacity the company will erect modern machine shops for the manufacture of internal combustion engines, motor trucks, etc.

The B. C. Electric Railway Company, Vancouver, B. C., is building a new car barn and workshop at New Westminster to cost $25,000.

The city of Calgary, Alberta, will undertake to supply power up to 1,800 hp to the C. P. R. shops that are to be erected there.

The car shops the Canadian Pacific Railway Company is to build at Calgary, Alberta, will cost $2,250,000 and employ about 2000 men.

The McConnell Iron Works Company has purchased the plant and business of the Brandon Implement & Mfg. Company, Brandon, Man.

The municipality of High River, Alberta, will spend $125,000 on waterworks and sewerage, for which plans are being prepared.

The Schaake Machine Works Company, New Westminster, B. C., has applied for the lease of several water lots on Lulu Island as a site for machine works to cost $50,000.

G. W. Robinson, secretary-treasurer of the city of Lethbridge, Alberta, will receive up to November 24 tenders for the following equipment for power station extension: Boiler and accessories, mechanical draft and economizer, steam turbo-generator set and condensing equipment, steam engine driven exciter, substation equipment.

Government Purchases

WASHINGTON, D. C., October 23, 1911.

The office of the Commissioners of the District of Columbia will receive bids until November 9 for furnishing and delivering one gasoline self-propelled pumping engine for use in the fire department of the District of Columbia.

The Paymaster General, Navy Department, Washington, will open bids Oct. 31, under schedule 3972, for one electrically-operated dough-mixing machine, one vertical single-barrel steam capstan and one gas-producing apparatus, all for Mare Island Navy Yard.

The Isthmian Canal Commission, Washington, opened bids October 17, for furnishing two motor-driven centrifugal pumps, capacity 1500-gal. each, as follows: Alberger Pump Company, New York, $5700 and $5769; American Well Works, Aurora, Ill., $5457; Blackall & Baldwin, New York, $4651 and $4926; Camden Iron Works, Camden, N. J., $6000; De Laval Steam Turbine Company, Trenton, N. J., $5900; Manning, Maxwell & Moore, New York, $5788.20; Platt Iron Works, Dayton, Ohio, $5700; Aldene Union Company, Schenectady, N. Y., $5820; Henry R. Worthington, New York, $5557, $5678 and $6226; Westinghouse Electric & Mfg. Company, $4994, $5289 and $5495.

The Strauss Bascule Bridge Company, Fort Dearborn Bldg., Chicago, reports that its design has recently been adopted for the following new bridges: Stark County Commissioners, Canton, Ohio, 37-ft. single-leaf span over the Ohio & Erie canal at Massillon, Ohio; Department of Public Works of Canada, A. R. Dufresne, assistant chief engineer, Ottawa, Ont., 55-ft. 6-in. single-leaf highway span over St. Andrew's Lock near Winnipeg, Man.; United States Government, Lieut.-Col. J. G. Warren, corps of engineers, U. S. Army, Buffalo, N. Y., 165-ft. single-leaf highway span over Black Rock Channel at Ferry street, Buffalo.

The Cape Cod canal will be completed in 1913, according to Commodore J. W. Miller's prediction before the Atlantic Deeper Waterways convention at Richmond, Va., last week. He said that more than 25,000,000 tons of shipping is now at the mercy of Cape elements each year. From deep water in Buzzards Bay to the end of the eastern breakwater will be only 13 miles. The channel will be 30 ft. deep at high water and will have no locks. It will be lighted electrically and a railroad has been constructed the whole length of the line. One-half of the work has been completed.

Trade Publications

Blue Print Machine.—Revolute Machine Company, 417 East Ninety-third street, New York, N. Y. Pamphlet. Describes and illustrates a new type of blue print machine in which arc lamps especially made for this kind of work are employed. The various features of the machine are described and there are halftone engravings showing both sides of it, as well as a sectional line drawing.

Heating and Ventilating.—The Green Fuel Economizer Company, Matteawan, N. Y. Pamphlet. Contains a reprint of the description of the heating system in the foundry of the Waterbury Castings Company, which appeared in *The Iron Age*, January 27, 1910. The shop heating and ventilating system used in the Abendroth & Root Mfg. Company's plant is also illustrated.

Steel Posts and Poles.—American Steel Post Company, Santa Fe avenue and Violet street, Los Angeles, Cal. Pamphlet. Concerned with the Carbo steel posts which can be used for fencing factory properties and railroad rights of way and for use as flag poles and poles for supporting wires for various purposes.

Boring and Turning Mill.—Colburn Machine Tool Company, Franklin, Pa. Bulletins Nos. 45 and 46. Illustrate the 30-in. and 34-in. boring and turning mills of this company. The smaller size which is covered in Bulletin No. 45 has swivel turret head and belt feeds and the other has swivel turret head and all geared feeds. Both machines can be equipped for adjustable-speed motor drive, while the larger one can also be driven by a constant-speed motor. Both tools are illustrated both with and without the various parts indicated. An illustrated description of a 30-in. mill appeared in *The Iron Age*, March 9, 1911.

Tool Steel.—Charles G. Stevens Comany, Monroe and Jefferson streets, Chicago, Ill. Catalogue. Lists the various kinds of high-grade tool steel carried in stock by this company.

Pipe Unions.—National Tube Company, Frick Building, Pittsburgh, Pa. Folder. Concerned with the Kewanee union which it is pointed out has no inserted parts. These unions are tested individually at the factory with 125 lb. of compressed air while immersed in water. An illustrated description of the durability test to which these unions are subjected appeared in *The Iron Age* June 9, 1910.

Thermometers.—The Brown Instrument Company, 311 Walnut street, Philadelphia, Pa. Circular No. 5. Covers a line of thermometers which are made in both V shape and round case styles as well as with separable sockets. These instruments can be furnished with either straight or angle stems as may be desired. In addition chemical thermometers having paper, porcelain and etched scales are also listed.

Lubricants.—International Acheson Graphite Company, Niagara Falls, N. Y. Pamphlet entitled Three Little Stories of Three Big Events and Three Winning Lubricants. Describes the aeroplane flight of Lincoln Beachey over Niagara Falls, the winning of a 500-mile automobile race at Indianapolis and the Vanderbilt cup race. The lubricant used in these three events was Oildag, which is the deflocculated graphite diffused in oil. The advantages of this lubricant together with Gredag, which is a combination of graphite and grease, are pointed out.

Lathe Chucks.—The Hoggson & Pettis Mfg. Company, New Haven, Conn. Catalogue No. 9 C. Concerned with the Sweetland lathe chucks, which are made in the independent, geared scroll and combination styles. All of these are illustrated and tables showing the different sizes in which the chucks are made are given under the halftone engravings. Space is also given to reversible and face plate jaws and a number of special chucks, including round and square base planer chucks, a positive driving drill chuck and a friction chuck for cutting-off machines, lathes and screw machines.

Grinding and Polishing Machinery.—The Webster & Parks Tool Company, Springfield, Ohio. Pamphlet. Size, 6 x 9 in.; pages, 31. Deals with a line of grinding machines ranging from a small bench grinder weighing 50 lb. to self-oiling floor machines handling wheels 30 in. in diameter and 6 in. wide. Several types of buffing and polishing lathes are also shown, together with a special ring-wheel and grinder and one for plate edges. A sliding-head attachment, a plain surface grinding attachment, bevel safety flanges for use on the sides of bevel abrasive wheels and wheel guards are also illustrated and briefly described. The construction of the automatic oiling devices used on the grinder and the buffing and polishing lathes is shown.

Fans.—Garden City Fan Company, Chicago, Ill. Two sectional catalogues. The first, No. 110, illustrates the Standard and Cycloidal types of steel plate fans of this company, which are designed for blowing and exhausting. No. 120 covers a line of steel plate steam fans and hot blast apparatus. The various types of apparatus are illustrated in both catalogues and there are a number of line drawings showing the different positions of discharge openings that can be furnished.

Electric Welding.—The Toledo Electric Welder Company, Knowlton and Langland streets, North Side, Cincinnati, Ohio. Bulletin No. 10. Shows how metal sheets can be joined together by the spot-welding process at any desired point by a spot the size of a rivet without punching holes or using rivets. After a discussion of the savings effected by this process a number of the different machines used are illustrated and described.

Tanks.—Hamburg Boiler Works, Hamburg, Pa. Catalogue No. 3. Concerned with a line of tanks of all descriptions for water, gas and air, which can be used as blow-off, drip, pressure, elevator, pneumatic and receiver tanks. These are made in a number of different sizes ranging in capacity from 40 to 1000 gal. The dimensions and weight of the various tanks are given and a number of rules for ascertaining the safe working pressure of a cylindrical tank or plate steel drum completes the catalogue.

Machine Tools.—The W. P. Davis Machine Company, 257 St. Paul street, Rochester, N. Y. Loose leaf catalogue. Lists a line of machine tools, which includes lathes, turret lathes, drills, key-seaters, cutting-off machines and special machinery. The make up of the catalogue is identical for each tool, an engraving being given at the top of the leaf with brief specifications below and a condensed description at the bottom. Among the tools shown is the 26-in. turret boring, forming and turning lathe, an illustrated description of which appeared in *The Iron Age*, March 30, 1911.

Generators and Corliss Engines.—Allis-Chalmers Company, Milwaukee, Wis. Two bulletins. The first, No. 1080, superseding No. 1048, points out the advantages of using the Allis-Chalmers alternators which are built in both the engine and fly-wheel types. These machines are of the revolving field style and are built for voltages ranging from 240 to 13,200 and frequencies of 60 and 25 cycles per second. The construction of the generators is described at length, and the text is supplemented by halftone engravings, together with views showing the generators installed in a number of power houses. Bulletin No. 1512 is a reprint of a previous one giving general description and specifications for the builder's compound Corliss engines. These are built in a number of different types, all of which are illustrated.

Baling Presses.—Whitman Agricultural Company, St. Louis, Mo. Catalogue. Refers to a line of baling presses for all kinds of fibrous material. These can be operated by steam or belt power, by horsepower in the full circle type and also by hand. The various kinds of presses are all illustrated and briefly described.

Alternators and Incandescent Lamps.—General Electric Company, Schenectady, N. Y. Two bulletins. The first, No. 4847, describes the standard line of belt-driven alternating-current generators, known as the form B machines, which are built in capacities ranging from 50 to 200 kw. and are adapted for three-phase or two-phase windings without change except in the armature coils, the exciters and all the accessories being the same for both types. These generators are wound for voltages of 240, 480, 600, 1150 and 2300 volts. No. 4850 illustrates and describes the new drawn-wire tungsten filament with which the Mazda lamps are now equipped. The pressed tungsten filament formerly used was inclined to be delicate, but the drawn-wire filament now employed does not suffer from this disadvantage since it is much stronger at all periods during its life. The bulletin is divided into four parts giving the construction, classification, uses and application of these lamps, and the illustrations show not only the lamps and the various accessories supplied but also typical installations. A number of curves showing the distribution of light with various types of reflectors are also reproduced, together with a diagram showing the comparison of electric-lighting costs between 1885 when it was possible to obtain 800 candle hours for $1 and the present time when it is possible to secure 8000 candle hours for the same amount.

Electrolier.—Waterloo Malleable Iron Works, Waterloo, Iowa. Bulletin No. 6. Treats of a new type of electrolier in which five gloves are mounted on cross-arms at the top.

Commutator Slotting.—National Carbon Company, Cleveland, Ohio. Booklet. Treats of the work done by the various manufacturers of electrical apparatus and commutators along the line of slotting or grooving commutators, which consists in cutting away the mica below the surface of the copper segments. The illustrations show the various methods employed from that of mounting the commutator in a lathe and performing the operation with a circular saw or lathe tool to the use of regular slotting machines or a shaper equipped with a special tool.

Automatic Stop-Valve.—Rockwell Furnace Company, 26 Cortlandt street, New York City, N. Y. Bulletin No. 29. Concerned with the Lalor automatic stop-valve for automatically stopping the flow of oil in case of breakage of the oil line or abnormal flow to the burners. These valves are made in sizes ranging from ½ to 4 in. and are designed to operate at from 10 to 200 lb. pressure without adjustment. If desired a master valve can be installed in the pumping system and will close automatically should any break of large proportion occur at any point on the system, while smaller valves can be placed on branch lines to control one or a group of furnaces. Exterior and sectional views of the valve are given as well as line drawings showing the location of the valves in a pumping system.

Press Guard.—Geuder, Paeschke & Frey Company, St. Paul avenue and Fifteenth street, Milwaukee, Wis. Circular. Concerned with the Cream City accident preventor for punch, stamping and forming presses and similar treadle-operated machines. The device, an illustrated description of which appeared in *The Iron Age*, May 4, 1911, consists of a folding gate that works automatically with the treadle and causes the gate to unfold in advance of the descent of the press, thus effectually blocking the approach to the die. There are a number of line drawings showing the various types of presses to which this device can be applied.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square.... ℔ 1.70¢
1½ to 4 in. x ⅜ to 1 in..... ℔ 1.80¢
1½ to 4 in. x ¼ to 5-1 ..... ℔ 1.80¢
Rods—⅜ and 11-16 round and square. ℔ 1.80¢
Angles: Cts. ℔ lb.
3 in. x ¼ in. and larger.....1.80¢
3 in. x 3-16 in. and ⅛ in. .....2.20¢
1½ to 2½ in. x ⅛ in.....1.95¢
1½ to 2¾ in. x 3-16 in. and thicker....1.85¢
1 to 1¼ in. x 3-16 in. .....1.95¢
1 to 1¼ x ⅛ in. .....2.00¢
⅞ x ¼ in. .....2.10¢
¾ x ¼ in. .....2.15¢
⅝ in. x ¼ in. .....3.35¢
½ x 3-32 in. .....4.40¢
Tees:
1 in. .....2.25¢
1¼ in. .....210¢
1½ to 2½ x ¼ in.....1.90¢
1½ to 2½ x 3-16 in..... .....2.00¢
3 in. and larger..... .....1.85¢
Beams .....1.80¢
Channels, 3 in. and larger..... .....1.80¢
Bands—1½ to 6 x 6-16 to No. 8.....2.00¢
Burden's "H. B. & S." iron, base price....2.95¢
"Burden's Best" iron, base price.....3.15¢
Norway bars .....3.00¢

Merchant Steel from Store—

per lb
Bessemer machinery .....1.70¢
Toe calk, tire and sleigh shoe.....2.50@3.00¢
Best cast steel, base price in small lots.....7¢

Sheets from Store—

Black

	One pass, soft steel.	C.R. R. G. cleaned.
No. 16.....	℔ lb 2.45¢	2.75¢
Nos. 18 to 20.....	℔ lb 2.50¢	2.85¢
Nos. 22 and 24.....	℔ lb 2.55¢	2.95¢
No. 26.....	℔ lb 2.60¢	3.05¢
No. 28	℔ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ℔ lb 12 @14¼
Patent planished, W. Dewees Wood.....℔ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14.....℔ lb 2.75¢
No. 24 .....℔ lb 3.10¢
No. 26.....℔ lb 3.30¢
No. 28.....℔ lb 3.60¢

No 20 and lighter 36 inches wide. 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24.....℔ lb 5.50¢
No. 26.....℔ lb 6.00¢
No. 28.....℔ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24..... ℔ 100 sq. ft...	$3.75	$4.70
No. 26..... ℔ 100 sq. ft...	2.85	3.90
No. 28..... ℔ 100 sq. ft...	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:
IC, 14 x 20.....$6.65
IX, 14 x 20..... 7.90
A. charcoal:
IC, 14 x 20.....$5.60
IX, 14 x 20..... 5.70

American Coke Plates—Bessemer—
IC, 14 x 20.....107 lb.....$4.50
IX, 14 x 20..... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating.....$8.70
IX, 20 x 28 with an 8 lb. coating.....10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ℔ lb

High Brass Rods—

List February 1, 1911. 14⅜¢ ℔ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ℔ lb

Brass Wire—

List February 1, 1911. 14⅜¢ ℔ lb

Copper Wire—

Base price. Carload lots mill 13½¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) .....℔ lb 17¢
Sheet copper cold rolled, 1¢ ℔ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ℔ square foot.
Sheet copper polished over 20 in. wide, 2¢ ℔ square foot.
Planished copper, 1¢ ℔ square foot more than polished.

METALS—

Tin—

Straits pig.....℔ lb 44 @45 ¢

Copper—

Lake ingot .....℔ lb 14 @14¼¢
Electrolytic .....℔ lb 13¾@14 ¢
Casting .....℔ lb 13¾@14 ¢

Spelter—

Western .....℔ lb 6¾@ 7¼¢

Zinc—

No. 9, base, casks...℔ lb 8½¢ Open...℔ lb 9¢

Lead—

American pig ....℔ lb 5 @5¼¢
Bar .....℔ lb 6¾@6¾¢

Solder—

½ & ½, guaranteed.....℔ lb 25½@26¢
No. 1 .....℔ lb 23½@24¢
Refined .....℔ lb 22½@23¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson .....℔ lb..@10¾¢
Hallets .....@10 ¢
Other brands .....9@ 9¾¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting.....21¢ and 22¢
Rods and Wire.....Base price 31¢
Sheets .....Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A. TRADE MARK

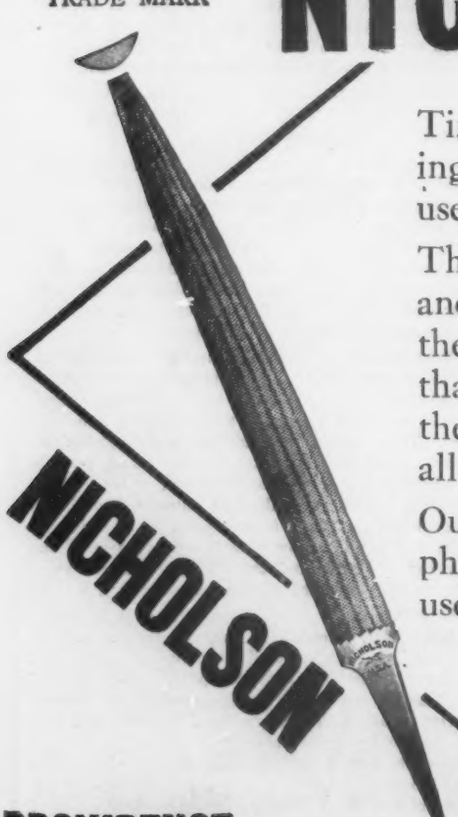
NICHOLSON

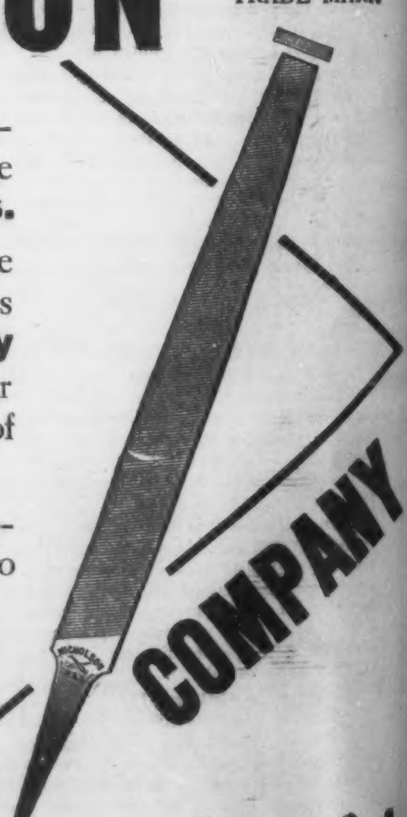
NICHOLSON U.S.A. TRADE MARK

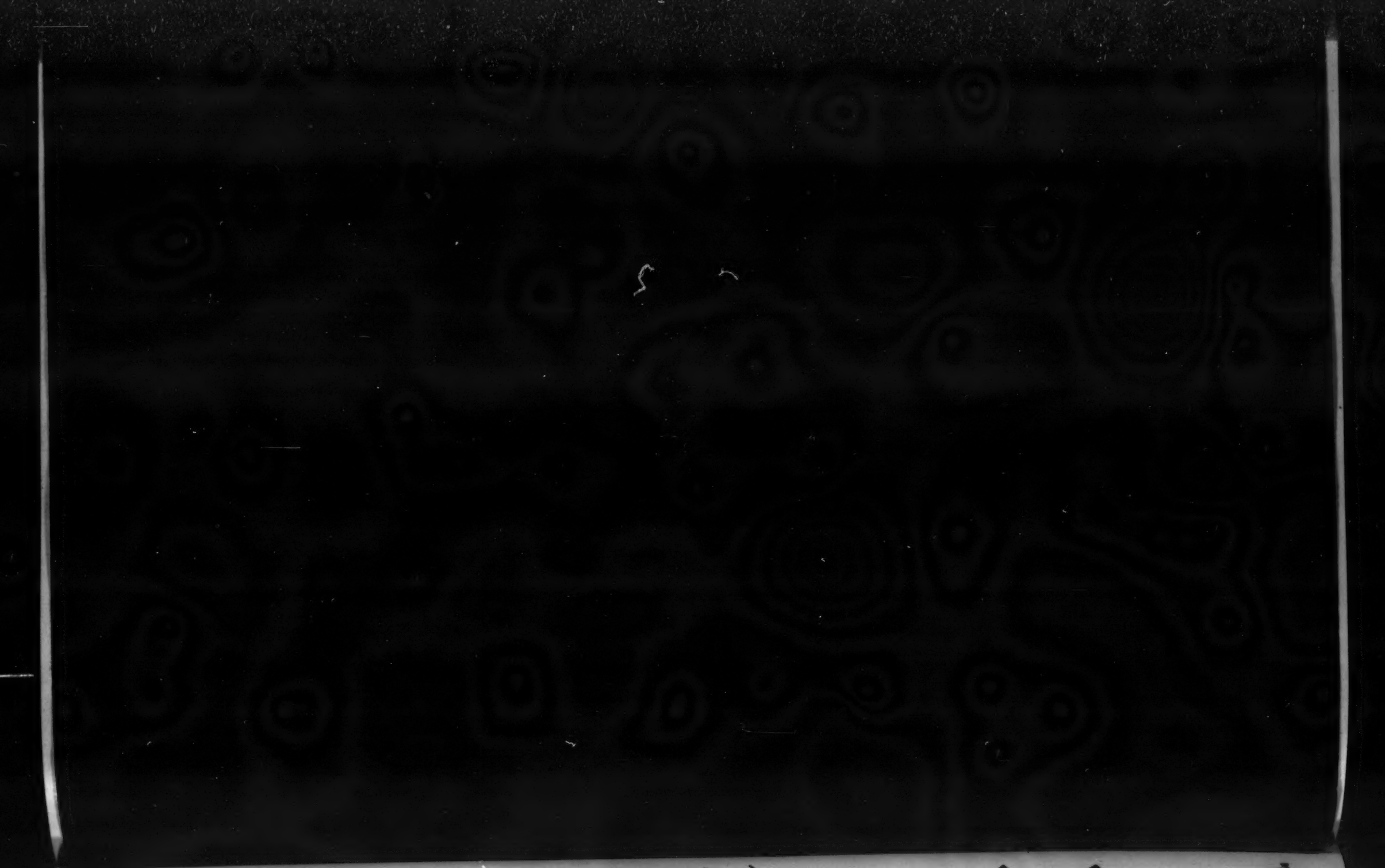
Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

Our Book, "File Filosophy," tells how best to use them.





NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.